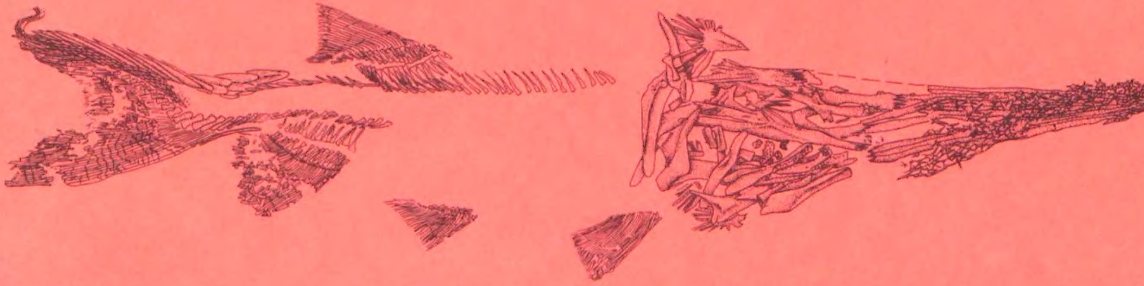
FIELD MUSEUM OF NATURAL HISTORY

COLLECTIONS AND RESEARCH



1991 REPORT

TO

THE BOARD OF TRUSTEES

Cover: Fossil and living paddlefishes (family Polyodontidae). Top and bottom drawings are of a living species, *Polyodon spathula*, which today inhabits much of the Mississippi River drainage. Center drawing is of a fossil species, *Crossopholis magnicaudatus*, from 50 million year old limestone deposits of the Green River Formation, Wyoming. Drawings taken from Grande and Bemis, 1991 (complete reference in text; see publication list for L. Grande, Department of Geology).

Jonathan Haas
Field Museum of Natural History
Collections and Research
Roosevelt Road at Lake Shore Drive
Chicago, Illinois 60605-2496

FIELD MUSEUM OF NATURAL HISTORY
COLLECTIONS AND RESEARCH

Report to the Board of Trustees
1991

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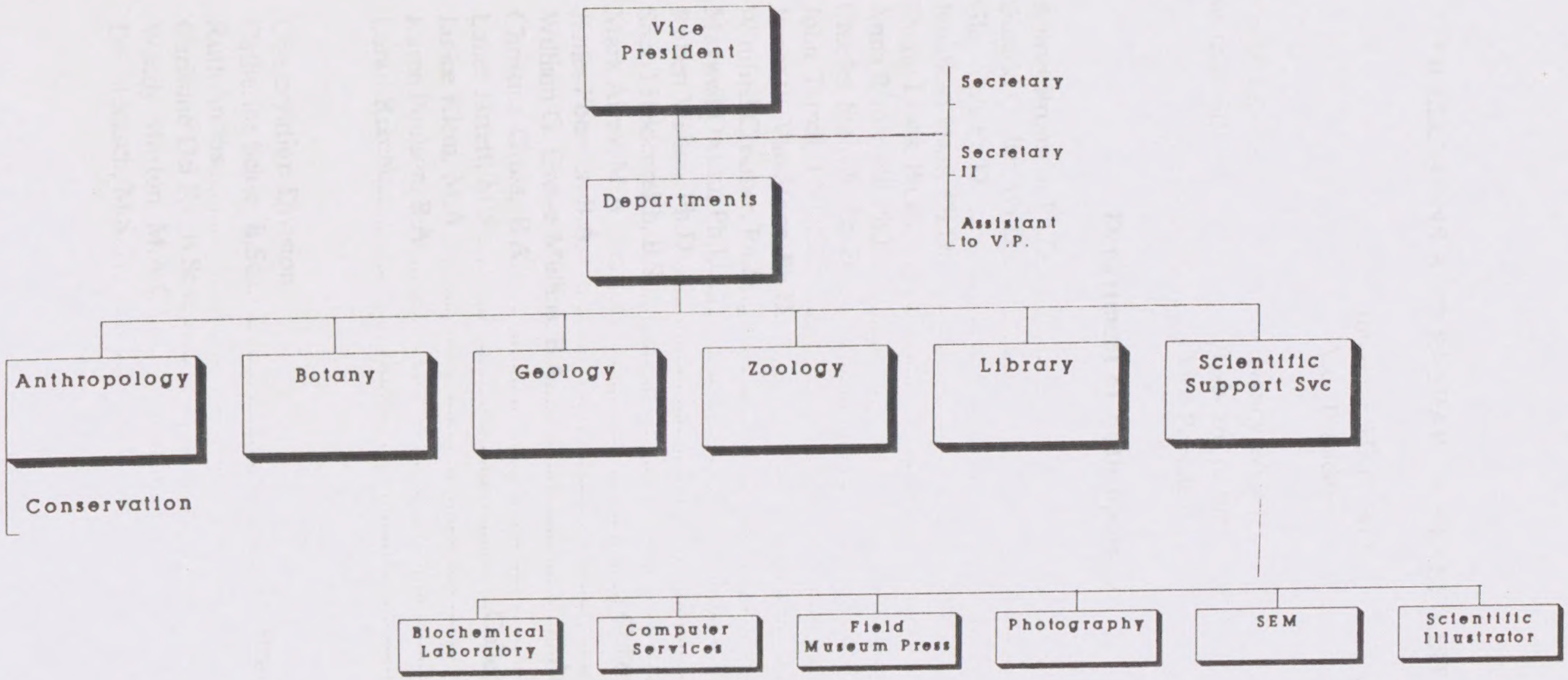
COLLECTIONS AND RESEARCH



1991

COLLECTIONS AND RESEARCH STAFF LIST

Jonathan Haas, Ph.D.
Vice President

Vivian Ploense Secretary II	Nancy Walsh Assistant to the Vice President	Darlene Pederson Secretary to the Vice President

Department of Anthropology

Bennet Bronson, Ph.D	Curator and Chairman
Donald Collier, Ph.D	Curator Emeritus
Glen Cole,Ph.D	Curator
Jonathan Haas, Ph.D	Curator
Phillip Lewis, Ph.D	Curator
Anna Roosevelt, Ph.D	Curator
Charles Stanish, Ph.D	Assistant Curator
John Terrell, Ph.D	Curator
James W. Van Stone, Ph.D	Curator
Winifred Creamer, Ph.D	Visiting Assistant Curator
Maxwell Owusu, Ph.D	Visiting Curator
Robert Welsch, Ph.D	Visiting Associate Curator
Sheryl Heidenreich, B.S	Administrative Assistant
Mark Alvey, M.A	Collections Management Assistant
James Foerster, B.A	Department Secretary
William G. Grewe-Mullins, B.A	Assistant Collections Manager
Christine Gross, B.A	Collections Manager
Lanet Jarrett, M.S	Collections Management Assistant
Janice Klein, M.A	Registrar
Karen Poulson, B.A	Lab Technician
Loran Recchia	Technical Assistant

Conservation Division

Catherine Sease, B.Sc	Head, Division of Conservation
Ruth Andris	Restorer
Christine Del Re, B.Sc	Associate Conservator
Wendy Morton, M.A.C	Assistant Conservator
David Rasch, M.S	Assistant Conservator

Department of Botany

John Engel, Ph.D	Curator and Chairman
William C. Burger, Ph.D	Curator
Michael Dillon, Ph.D	Curator
Robert Stolze, B.S	Associate Curator
Gregory M. Mueller, Ph.D	Assistant Curator
Thomas G. Lammers. Ph.D	Assistant Curator
Michael Huft, Ph.D	Visiting Assistant Curator
Elizabeth Moore, B.S.N	Administrative Assistant
Nancy Alaks, B.S	Herbarium Assistant
Birthel Atkinson	Preparator
John Best, B.S	Herbarium Assistant
Stephen Dercole, B.S	Collection Manager, Cryptograms
Darlene Dowdy	Preparator
Nancy Hensold, Ph.D	Research Assistant
Jennifer Jones	Preparator
Gail Kushino, B.S	Herbarium Assistant
George Murray, A.A	Herbarium Assistant
Christine Niezgoda, M.S	Collection Manager, Phanerogams
Jean Oglesbee, B.S	Herbarium Assistant
Freddie Robinson	Preparator
Ralph Rogers	Preparator
Kevin Swagel, B.S	Herbarium Assistant
Donna Williams, B.S	Herbarium Assistant
Qui-xin Wu, Ph.D	Collections Manager, Cryptogams

Department of Geology

Peter Crane, Ph.D	Curator and Chairman
Edward J. Olsen, Ph.D	Curator Emeritus
William D. Turnbull, Ph.D	Curator Emeritus
Bertram Woodland, Ph.D	Curator Emeritus
Rainer Zangerl, Ph.D	Curator Emeritus
John R. Bolt, Ph.D	Curator
John J. Flynn, Ph.D	Associate Curator
Lance Grande, Ph.D	Associate Curator
Scott H. Lidgard, Ph.D	Associate Curator
Matthew H. Nitecki, Ph.D	Curator
Olivier C. Rieppel, Ph.D	Curator
Monica Mikulski, A.A	Administrative Assistant

Gregory Buckley, M.S	Collections Manager, Invertebrate Paleontology
Mathew Cotton, M.S	Research Assistant, Paleobotany
Patricia Grewe-Mullins, B.A	Symposium Assistant
Eric Gyllenhaal, Ph.D	Postdoctoral Associate, Exhibits and Fossil Mammals
Sara Hoot, Ph.D	Postdoctoral Associate, Paleobotany-Molecular Systematics
Paul Kenrick, Ph.D	Post-Doctoral Associate/Paleobotany
Robert Masek	Preparator/Fossil Fish
Steven McCarroll, B.S	Preparator/Collections Assistant
Clarita Nunez, M.S	Collections Manager/Minerology and Assistant, Paleomagnetics
William F. Simpson, B.S	Chief Preparator/Fossils
Elaine Zeiger, B.Mus	Secretary

Department of Zoology

Scott Lanyon, Ph.D	Associate Curator and Chairman
Emmet Blake, D.Sc	Curator Emeritus, Birds
Philip Hershovitz, M.S	Curator Emeritus, Mammals
Melvin Traylor, Jr., A.B	Curator Emeritus, Birds
Rupert Wenzel, Ph.D	Curator Emeritus, Insects
Hymen Marx, B.A	Curator Emeritus, Amphibians and Reptiles
Norann Miller	Administrative Assistant

Division of Amphibians and Reptiles

Harold Voris, Ph.D	Curator and Head
Robert Inger, Ph.D	Curator
Alan Resetar, M.L.S	Collection Manager
Molly Ozaki	Secretary
Susan Zaleski, B.A	Technical Assistant

Division of Birds

Scott Lanyon, Ph.D	Associate Curator and Head
Pamela Austin, B.S	Lab Technician
Tom Gnoske	Preparator
Diane Maurer, B.A	Assistant
David Willard, Ph.D	Collection Manager

Division of Fishes

Barry Chernoff, Ph.D	Associate Curator and Head
Mark Westneat, Ph.D	Assistant Curator
Tom Anton, B.S	Data Entry, Collections Clerk
Paulo Buckup, Ph.D	Postdoctoral Associate

Janeen Jones, B.A.	Data Entry/Collections Clerk
Mary Anne Rogers, M.S.	Collection Manager
Alberta Simpson, B.S.	Computer Supervisor
Kevin Swagel, B.S	Technical Secretary

Division of Insects

Alfred Newton, Jr., Ph.D.	Associate Curator and Head
John Kethley, Ph. D.	Associate Curator
Brian Fisher, M.S.	Technical Assistant
Julie Papp, M.S.	Technical Assistant
Philip Parrillo, B.S.	Curatorial Assistant
Stephan Robinet, B.S.	Technical Assistant
Daniel Summers, M.S., M.B.A.	Collections Manager
Fred Werner, A.B.	Technical Assistant

Division of Invertebrates

Rudiger Bieler, Ph.D.	Assistant Curator and Head
Janet Voight, Ph.D.	Assistant Curator
Margaret Baker, B.S.	Office/Collections Manager

Division of Mammals

Bruce Patterson, Ph.D.	Associate Curator and Head
Lawrence Heaney, Ph.D.	Associate Curator
Lisa Albers	Preparator Assistant
Barbara Brown, B.S.	Technical Assistant
Steven Goodman, B.S.	Field Biologist
William Kephart, B.A.	Preparator/Tanner
Julian Kerbis, Ph.D.	Curatorial Associate
Melissa Morales, B.A.	Technical Assistant
A. Townsend Peterson, Ph.D.	Postdoctoral Associate
John Phelps, M.S.	Technical Assistant
Rosa Salazar-Boone	Technical Assistant
William Stanley, M.A.	Collection Manager

Library Staff

W. Peyton Fawcett, B.A.	Librarian
Benjamin Williams, M.A.	Associate Librarian; Librarian, Special Collections
Michele Calhoun, M.S.L.S.	Librarian, Reference and Public Service
Chih-wei Pan, M.S.	Librarian, Cataloging
Roger Buelow	Manager, Publications Sales

Sarah Bridger	Library Assistant, Acquisitions
Joel Caithamer, B.A	Library Assistant, Circulation and Collections Inventory
Janeen Devine, B.A	Library Assistant, Interlibrary Loans
Kenneth Grabowski, M.S	Library Assistant, Technical Processing
Christina Modschiedler, B.A	Library Assistant, Serials and Publications Exchange
Michael Trombley, M.F.A	Library Assistant, Cataloging and Resource Centers

Scientific Support Services

Computing Services.

James W. Koeppl, Ph.D	Computer Systems Manager
Peter E. Lowther, Ph.D	Computer Systems Specialist/Acting Manager
Gregory Kotulski	Computer Systems Specialist
Wen-Lii Liu, M.S	Computer Systems Specialist
Dahao Wang	Computer Systems Specialist

Scientific Illustration

John J. Engel, Ph.D.*	Supervisor, Scientific Illustrators
Zorica Dabich, B.F.A	Scientific Illustrator
Zbigniew Jastrzebski, M.F.A	Senior Scientific Illustrator
Clara Richardson Simpson, M.S	Scientific Illustrator
Marlene Werner, A.A	Scientific Illustrator

Scanning Electron Microscope

Betty Strack, M.S	SEM Technician

Biochemical Laboratories

John Hall, Ph.D	Manager, Biochemistry Laboratories
Jeannette Briggs	Lab Research Technician

Field Museum Press

Harold K. Voris, Ph.D.*	Scientific Editor, Field Museum Press
Marjorie Pannell	Editorial Coordinator, Field Museum Press

Scholarship Committee

Lance Grande, Ph.D*	Chairman, Scholarship Committee
Vivian Ploense*	Secretary, Scholarship Committee

Photography

John Weinstein, B.F.A.	Head Photographer
Nina Cummings, B.A.	Photo Researcher
Michael Hay, B.F.A.	Department Clerk
Diane Alexander White, B.A.	Photographer
James Balodimas, B .A.	Photographer
Linda Dorman, B.A.	Darkroom Technician

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*Second listing. Name appears already in staff list.

INTRODUCTION TO THE ANNUAL REPORT - 1991

STRATEGIC PLANNING

In 1991 the Collections and Research Division of the Field Museum embarked on a strategic long-range planning process to examine future goals and direction of the Division. The planning for the Division is being closely integrated with comprehensive strategic planning for the Museum as a whole as the institution sets a course for the start of our second century.

Why do we need to engage in a strategic planning process? As can be seen in this Annual Report, our collections and research activities are going along extremely well. The curators have an excellent record in active research and publication, the collections are growing and generally well-maintained, and we have had increasing success in getting research and collections support from a growing diversity of funding sources. With this excellent record, one might be reminded of the adage "If it ain't broke, don't fix it."

However, the world around us is in a period of dynamic change and challenge and these dynamics are nowhere more evident than in natural and cultural landscapes that stand at the heart of natural history museums. At the global level we are witnessing the progressive demise of natural habitats, the threat of major climate change, and the endangerment of many of the world's diverse cultural traditions. Nationally and locally this is a time of significant financial stress, which gives rise to pressing questions of whether and how basic research and care of natural history collections can be effectively

funded. On an intellectual level, systematic biology and museum anthropology, the areas of primary research at Field Museum, are in a period of critical self-examination to assess goals and priorities for the future. Given the global, financial and intellectual environments today, Field Museum must look to alternative pathways for the future if we hope to continue to play an active and leading role in the internatinal, local, and scientific communities.

Strategic planning is not intended to either induce change for the sake of change or blindly reaffirm the status quo. It is intended as a means of focusing our attention, energy and resources on key issues facing the Collections and Research Division in the coming decades. "Focusing" does not mean a narrowing of our research agenda. Rather, it means clarifying the vision to allow us to be more effective in carrying out the mission and goals of the institution.

The strategic planning process within Collections and Research is being carried out with the combined participation of the staff, the President, and the Collections and Research Committee of the Board of Trustees. Within the Division a Strategic Planning Task Force has been established consisting of the four departmental chairs, four representatives from the Science Advisory Council, three at-large representatives, and the Vice President of Collections and Research. Task Force members include: Jonathan Haas, chair, Bennet Bronson, Anthropology, Charles Stanish, Anthropology, Michael Dillon, Botany, John Engel, Botany, Christine Niezgoda, Botany, Peter Crane, Geology, John Flynn, Geology, Barry Chernoff, Zoology, Lawrence Heaney, Zoology, Scott Lanyon, Zoology, and Nancy Walsh, Collections and Research.

The task force met in December for a two day retreat to begin addressing the full range of issues facing the Division today. The group used a broad set of questions to guide and focus the initial discussions. These questions addressed everything from the value of our research efforts in the global scientific community, to options for collections growth or contraction, to the role of Collections and Research in the public and educational programs of the Museum. The strategic planning process is on-going within the Division, and it is now being directly coordinated with broader strategic planning for the Museum as a whole. Preparation of the strategic planning report for Collections and Research will be completed in the context of the larger Museum endeavor. The results of this strategic planning process will be presented in the 1992 Annual Report.

EXTERNAL REVIEWS

As part of the on-going process of having each department in the Division reviewed on a regular basis, two departments were reviewed in 1991: Geology and Anthropology. For each of these reviews we brought in a committee of outside scholars to review the mission, goals, accomplishments, staffing, hiring, and organization of the individual department.

For the Anthropology review, the committee consisted of Robert Carneiro (American Museum of Natural History), Linda Cordell (California Academy of Sciences), William Sumner (Director of the Oriental Institute, University of Chicago), and Patty Jo Watson (Washington University). While the committee addressed many aspects of the department, they had three broad recommedations for the department.

1. RESEARCH. The committee felt that the research quality and productivity can and should be enhanced through strategic hiring of new curators; encouraging curators to participate more fully in the intellectual life of the Museum, including other departments, local communities and the community at large; and increased support for research.

2. COLLECTIONS. The committee felt that collections maintenance could be improved through establishing departmental policies and priorities, some departmental reorganization, and clarifying the role of the curators in the management of the collections.

3. PUBLIC EDUCATION. The committee stated that the curators should play a larger role in the public educational programs of the museum. In particular they felt that curatorial contributions to the conceptualization, design, and execution of museum exhibits are essential to the intellectual and educational integrity of those programs. They urged the administration to examine current policy and practice on exhibits design in order to fully integrate the anthropology curators into the process. On the departmental level they urged the curators to take advantage of opportunities to participate in all aspects of Museum educational programs.

For the Geology review the committee consisted of Sandra Carlson (University of California, Davis), Gordon Eaton (Director of the Lamont-Doherty Geological Observatory, Columbia University), David Raup (University of Chicago), and James

Tyler (Associate Director of National Museum of Natural History, Smithsonian). This committee addressed several critical issues in the Department.

1. With the recent retirement of Ed Olsen, the Department must consider different options for handling the meteorites collection, including the possibility of loaning the collection to the University of Chicago. In filling what has traditionally been a meteorites curatorial position, the Department should consider what field of mainline geology would best compliment the dominant paleontological nature of the rest of the Department.

2. Most curators in the Department are currently carrying a very heavy burden of service to the field and the institution, and steps should be taken to insure them adequate time for research and publication. The high quality of the curatorial faculty in this department was raised in many contexts by the committee.

3. The curators should always be called upon to either provide the factual contents in public exhibits or approve that which has been provided by contractors or developers. In addition, the administration should determine how to increase the involvement of curators and other Geology Department staff in the Museum's education programs, such as adult education classes and special classes.

4. The Department and administration must take extra steps to pursue affirmative action in the Department in order to insure a balance of diversity.

INSTITUTE FOR MUSEUM SERVICES GENERAL CONSERVATION SURVEY

In addition to the regular external reviews of the individual departments, a comprehensive survey was conducted of the current condition of the conservation of all the collections in the Collections and Research Division. This is one of the first times that a conservation survey of this scope has ever been conducted in an institution with collections as large and diverse as those at Field Museum. This survey, directed by Catherine Sease of our Conservation Department, was supported by funds from the Institute for Museum Services, with matching funds provided by Field Museum. The panel consisted of some of the foremost natural history conservation specialists in the country today: Carl Patterson (Denver Art Museum); Tamsen Fuller (private consultant); Gerald Fitzgerald (Canadian Museum of Nature); Robert Waller (Canadian Museum of Nature); William Minter (private consultant); Monona Rossol (ACTS, Inc.); and Wendy Jessup (Private consultant).

The survey addressed specific departmental problems, issues related to the exhibition of materials, safety issues, disaster planning, and pest management. Although the results of this survey will not be submitted until early in 1992, preliminary results show that many recommendations will emerge to help the Museum take better care of its extraordinary collections as it approaches its second century.

GRANTS

As noted in the section below on Grant Awards in 1991, the Division had a year marked by exceptional success. Alongside significant facilities grants awarded by the National

Science Foundation in Anthropology, Botany, Geology, Fishes, and Amphibians and Reptiles, there were numerous major grants made to support the individual research efforts of our curators.

Peter Crane received funding from the National Science Foundation and the American Chemical Society for his research into the origins and evolution of flowering plants and global climate change in the geological past. John Flynn, with funding from multiple sources, is continuing his research on changes in the earth's magnetic fields and the evolution of early carnivores. John Terrell and Rob Welsh received major support from the National Endowment for the Humanities to allow them to continue their research into the continuity of highly diverse cultures in Papua New Guinea. Michael Dillon was funded by the National Geographic Society to conduct an inventory of the plants in a remnant of one of the standing humid forests in Peru. This research is a vital step in the long-term preservation of the biological diversity of one of the richest zones of natural resources in the world.

In the course of 1991, our curators and research scientists were involved in field work and colletions research throughout the United States and many foreign countries. A list of the locations of our research projects gives a window into the global scope of the work done by the scientists at Field Museum.

Australia
Bolivia
Brunei
Canada
Costa Rica
England
Hawaii
Madagascar
Mexico

Azores
Brazil
California
Chile
Crete
Florida
Honduras
Malaysia
Montana

New Zealand
Norway
Peru
Portugal
Thailand
Venezuela
Wisconsin
Zaire
Nevada
Panama
Philippines
Taiwan
Uganda
Virginia
Wyoming

NETWORKING

With the financial support and strong encouragement of the National Science Foundation, the Field Museum joined the CICNet network in 1991. This step directly links the Museum with all of the national and international computer networks, including Bitnet, Internet, and NSFNet. Field Museum is the first free-standing natural history institution in the nation to be joined to this network. Although the system is being introduced gradually within the Collections and Research Division, it will ultimately allow all of our curators, professional staff and associated research scientists to interact directly with colleagues and other institutions across the nation and the world. It is now possible for us to exchange data instantly, make inquiries as to the availability of specific specimens or artifacts, work jointly on manuscripts with colleagues in other cities, communicate directly with funding agencies in Washington, and establish stronger working relationships with universities around the U.S.

In concert with this newly developed networking capacity, we have entered into a joint project with the University of Illinois at Chicago. Within the medical school at UIC they have developed the foremost computer imaging department in the world. The computer scientists in this department have pioneered techniques for recording human anatomy, exploring alternatives for reconstructive plastic surgery, and forensic modeling of facial features from skeletal remains. We approached the department with the possibility of doing high resolution computerized imagery of our artifact collection in the Anthropology Department. They responded enthusiastically and we have embarked on a pilot project.

The objective of this project will be to develop a data base of computerized images of anthropology artifacts coupled with the catalogue data on those artifacts. With these data entered into the computer, a researcher can call the data base up on their computer, review images of the artifacts, and actually conduct studies of aspects of the artifacts. With the high-resolution capability, a person could look at a ceramic pot on the screen and then zoom in on a particular design element and print out that element for measuring or some other form of sylistic analysis. Furthermore, with our new networking capability, the researcher would not have to be in the Museum to call up this data. With our permission, they could access the data and the images from their home institution and review our collections without ever having to visit the Museum.

This new technology, once residing only in the realm of science fiction, today offers the obvious benefits of allowing the review and study of artifacts and specimens from a distance. It will greatly reduce the amount of handling of the artifacts and the need to move the objects from one place to another. The potential benefits of computer imagery and networking in terms of better care of the collections and greatly increased accessibility are enormous.

DEPARTMENT OF ANTHROPOLOGY

BENNET BRONSON (Ph.D. 1976, Pennsylvania) Chairman and Curator, Asian Archaeology and Ethnology. Joined Field Museum in 1971.

CURRENT RESEARCH:
Dr. Bronson spent two months in Southeast Asia this year, attending two conferences, tying up loose ends for his and Dr. Ho's Southern Thailand Project, and laying the groundwork for a future archaeological project to be conducted on the north coast of Java in Indonesia. He is currently engaged in studying ancient Middle Eastern glass found in Thailand and in collating information on 9th century Chinese ceramics found by other archaeologists in southern Asia and Africa. This should substantially improve our knowledge of early trade patterns in the Indian Ocean area. His current theoretical work relates to the causal relationships of technology and trade on the one hand and sociopolitical development on the other. His collections-oriented research on objects in Field Museum include studies of the history and symbolism of Chinese-Indonesian animal pastimes, recent Chinese ritual bronzes, and Far Eastern glass.

OTHER APPOINTMENTS:
Adjunct Professor, Center for Southeast Asian Studies, Northern Illinois University, DeKalb.

TEACHING:
2 graduate student interns from the University of Illinois at Chicago and Northern Illinois University.

WINIFRED CREAMER (Ph.D. 1983, Tulane) Visiting Assistant Curator, Northern Rio Grande Research Project. Joined Field Museum in 1989.

CURRENT RESEARCH:
Dr. Creamer continued to examine documentary records of 16th and 17th century New Mexico as part of the Northern Rio Grande Research Project. New information on the Pueblos included specific population numbers, village size, and changes over time. Spanish reports of the region are being used to develop a model of population change that can be tested with archaeological fieldwork.

OTHER APPOINTMENTS: Assistant Professor, Anthropology Department, Northern Illinois University.

JONATHAN HAAS (Ph.D. 1979, Columbia) Curator, New World Archaeology. Joined Field Museum in 1989.

CURRENT RESEARCH:
Dr. Haas continued overseeing the analysis of pottery from the test excavations of the Northern Rio Grande Research Project. This involves an in-depth examination of approximately 100,000 sherds from two seasons of testing in 13 protohistoric pueblos ruins in northern New Mexico. The purpose of this analysis is to develop a ceramic typology that can be used to to obtain dates for archaeological sites based on materials that are found on the surface without digging. Dr. Haas is also working with a team of ten physical anthropologists to develop a set of universal standards for recording basic data from human skeletal remains. He continues to work on the issue of repatriation, and worked with representatives of the Blackfeet Tribe of Montana and Native Hawaiians to enable the return of remains of their ancestors for reconsecration according to traditional practices.

PHILLIP LEWIS (Ph.D. 1966, University of Chicago) Curator, Primitive Art and Melanesian Ethnology. Joined Field Museum in 1952.

CURRENT RESEARCH:
Dr. Lewis continued his researches into the systems of art and society in New Ireland. Themes of continuity and change in the art continue to be the most fruitful research topics as New Irelanders themselves edge gingerly into the modern world. Although most of the extant collections from New Ireland tend to be traditional in form, it becomes more and more clear that the corpus of material cultural objects available for study are products of contemporary art systems. To study art in today's changing world, it will be very rare indeed to see "pure" traditional art, and we had better pay attention to the contemporary scene.

ANNA ROOSEVELT (Ph.D. 1977, Columbia University) Curator of Archaeology. Joined Field Museum in 1991.

CURRENT RESEARCH:
Dr. Roosevelt is involved in research on the trajectory of cultural and ecological adaptation in the tropical lowlands of South America. This year, she directed the second of the four archaeological field seasons in her two part National Endowment for the Humanities funded project (1988-1990, 1991-1993), the Developmental Sequence at Santarem on the Lower Amazon, Brazil. With the affiliation of the University of Sao Paulo and the Emilio Goeldi Museum in Belem, in July, August, and September of 1991, the 20-member research team

surveyed and excavated caves in the Monte Alegre area near Santarem. In December, conventional and accelerator radiocarbon dating on materials from one of the caves produced dates between 11,000 and 10,000 B.P. Dr. Roosevelt began an international interdisciplinary collaborative research project on the Human Dimensions of Global Change: A Case Study in Northern Venezuela. The project is based at the Center for Remote Sensing of Boston University and the Experimental University Francisco de Miranda, Coro, Venezuela and funded by the Venezuelan Academy of Sciences. The group of scientists from Venezuela, France, Belgium, and the United States, including geologists, geophysicists, oceanographers, archaeologists, plant physiologists, zoologists, conservationists, and historians held a planning session in Coro in December, 1991 and surveyed field research locations.

ADJUNCT APPOINTMENTS:
Distinguished Lecturer and Visiting Lecturer, Department of Anthropology, Harvard University.
Research Associate, Department of Anthropology, American Museum of Natural History.
Research Fellow, Center for Remote Sensing, Boston University.
Honorary Doctor of Humane Letters, Mount Holyoke College.

TEACHING:
Human Ecology and Cultural Evolution in the Tropical Lowlands of South and Central America (Harvard University, seminar for graduates and undergraduates).

2 current Ph.D. advisees (University of California at Los Angeles, State University of New York at Binghamton).
3 M.A. students (University of Sao Paolo, Universidade Estacial, Rio de Janeiro, Brazil).

CHARLES STANISH (Ph.D. 1985, University of Chicago) Assistant Curator, Middle and South American Archaeology and Ethnology. Joined Field Museum in 1987.

CURRENT RESEARCH:
Stanish spent a total of five months in Peru finishing the latest phase of his NSF-sponsored archaeological research in the Lake Titicaca Basin. This research phase involved intensive field research that was previously scheduled for most of 1991. His work included the supervision of an intensive surface survey and excavations of ancient settlements along the lake edge. The survey encountered 480 sites that date from 1300 BC to the Spanish Conquest in 1532. With the

fieldwork now completed on this phase of research, Stanish and his colleagues are preparing a large research report to be published in 1992. Stanish also submitted two papers that are now in press on Peruvian research. He also presented three additional scientific papers in 1991 on his field research which will ultimately be published in appropriate journals. He co-chaired a symposium on Titicaca Basin archaeology at the International Congress of Americanists in New Orleans in July.

ADJUNCT APPOINTMENTS:
Adjunct Professor, Department of Anthropology, University of Chicago.

TEACHING:
"Latin American Civilization", University of Chicago.

JOHN TERRELL (Ph.D. 1976, Harvard) Curator, Oceanic Archaeology and Ethnology. Joined Field Museum in 1971.

CURRENT RESEARCH:
Dr. Terrell, with Visiting Assistant Curator Robert L. Welsch, is studying to what extent and in what ways exchange relations in the Aitape District of West Sepik (Sandaun) Province, Papua New Guinea, have integrated local communities into "regional systems" extending beyond the level of economic and sociocultural integration represented by a face-to-face community. Their research is being supported by the National Endowment for the Humanities. With co-sponsorship by Field Museum and the Wenner-Gren Foundation for Anthropological Research, Inc., Dr. Terrell held a working seminar at the Museum during the first week of April 1991 attended by an international group of 12 leading Melanesianists to foster wider understanding of the aims, advantages, limitations, and achievable priorities of regionally-focused anthropological studies in Melanesia. Mr. Arapata Hakiwai, Curator of the Maori Collections at the National Museum, Wellington, New Zealand, has joined Dr. Terrell as Co-Curator of the renovation of the Museum's Maori meeting house, Ruatepupuke II (the project is scheduled to be completed in 1993). Several of Terrell's publications in 1991 illustrate his public efforts to help suggest options and possibilities for such new collaborative undertakings between the Museum and the native peoples represented by the Anthropology Collections at Field Museum.

Dr. Terrell was on leave from the Museum for 95 days in 1991, an unexpectedly long period, while adopting an infant son in Paraguay.

ADJUNCT APPOINTMENTS:
Adjunct Professor, Department of Anthropology, Northwestern University.

TEACHING:
"The Anthropological Construction of Knowledge," seminar at Northwestern University, Spring 1991.

JAMES VANSTONE (Ph.D. 1954, Pennsylvania) Curator, North American Archaeology and Ethnology. Joined Field Museum in 1966.

CURRENT RESEARCH:
Work continued on the preparation of a final report on archaeological excavations at an historic Yupik site on the Alaska Peninsula in 1985. This study is being carried out in cooperation with Dr. Don E. Dumond, University of Oregon, and completion is expected in 1992. VanStone's work also continued on projects related to the traditional ethnography of Inupiat Eskimos of the Kotzebue Sound region, Alaska based on historical research and fieldwork undertaken with Charles V. Lucier (retired) in 1949-52. A paper on the traditional oil lamp among the Kotzebue Sound Inupiat will be published in *Arctic Anthropology* in early 1992. A paper on historic pottery has been accepted for publication in *Etudes/Inuit/Studies* and one on traditional seal hunting techniques has been submitted to *Fieldiana:Anthropology*. A study of Blackfoot material culture is nearly completed and one on Chilcotin Indian material culture was begun.

ROBERT WELSCH (Ph.D. 1982, University of Washington) Visiting Associate Curator, A. B. Lewis Research Project. Joined Field Museum in 1984.

CURRENT RESEARCH:
Work continued on the A. B. Lewis Project, including preparations for 12 months of field research in the West Sepik Province of Papua New Guinea (beginning 1992) on a grant received from the National Endowment for the Humanities. Photographs of some 3,500 specimens from the North Coast of New Guinea have been taken and duplicated for this field research. Copies are to be deposited at the National Museum in Papua New Guinea and at the Museum für Völkerkunde in Dresden. Plans are also underway for collaborative research with Dr. Frank Tiesler (Museum für Völkerkunde, Dresden) who visited in May 1991. Important strides have been made to establish a North Coast Research Group to facilitate collaboration among the major scholars who conduct research on this part of Papua New Guinea. Dr. Welsch also assisted with and participated in the working seminar at Field Museum sponsored by the

Wenner-Gren Foundation for Anthropological Research and organized by Dr. John Terrell.

ADJUNCT APPOINTMENTS:
Research Associate, Department of Anthropology, Northwestern University.

TEACHING:
3 Independent Studies (2 undergraduate students), Northwestern University
Honors Thesis Supervision (1 undergraduate student), Northwestern University

DEPARTMENT OF BOTANY

JOHN J. ENGEL (Ph.D. 1972, Michigan State University) Chairman and Curator, Bryology. Joined Field Museum in 1972.

CURRENT RESEARCH:

John Engel has an established bryological research program in south temperate and subantarctic areas of the world. These areas present an ideal natural laboratory to investigate biological questions relevant to evolutionary persistence, dispersibility and survival and evolution of plants faced with environmental change. Engel is engaged in both monographic and floristic studies on temperate Australasian hepatics. He is collaborating with Field Museum Research Associate Rudolf Schuster on the *Hepatic Flora of New Zealand* project. In addition Engel is engaged in monographic studies on the family Geocalycaceae, a family that is large, complex and particularly diverse in south temperate and subantarctic regions. Engel also is investigating problems involving functional morphology of hepatic structures and is doing so with a world view. He publishes the *Index Hepaticarum Supplementum* series, each supplement covering a two year period. For each two year period all new taxa and combinations of liverworts and hornworts are indexed. The project is an ongoing one for the International Association of Bryologists.

WILLIAM C. BURGER (Ph.D. 1961, Washington University) Curator, Vascular Plants. Joined Field Museum in 1965.

CURRENT RESEARCH:

William Burger is completing a manuscript covering the 385 members of the coffee family (Rubiaceae) found in Costa Rica. Descriptions of all the species have now been completed. Two major loans, including *Hoffmania* and the genera of the Tribe Spermacocae, were important in finalizing the manuscript for these taxa. To facilitate identification, nearly all the species will be illustrated. Fifty-six plates have been drawn and it is estimated that another 10 plates will complete the illustrations. This work is being done in collaboration with Dr. Charlotte Taylor of the Missouri Botanical Garden, a specialist in Rubiaceae. Dr. Burger led a Field Museum Tour to Costa Rica in late November-early December. It proved to be a very rewarding experience, despite the slightly hectic pace and occasional rain.

MICHAEL O. DILLON (Ph.D. 1976, University of Texas) Curator, Vascular Plants. Joined Field Museum in 1978.

CURRENT RESEARCH:
Michael Dillon's research program centers upon the exploration, description, and systematic study of plant-life within the Neotropics of South America. The recent completion of the Bosque Monteseco floristic inventory marks the first step in the preparation of a comprehensive survey for several highly threatened habitats urgently in need of conservation efforts. With National Geographic Society grant funding, he and his Peruvian colleagues are continuing their floristic inventory of montane forests in northern Peru, including the description of many species new to science. Also, his work within the lomas formations continues with the results of several years of field studies now being published. His efforts within the Asteraceae, the largest family of flowering plants in Peru, has resulted in a computerized checklist containing over 2500 species names, the first such listing for any South American country. Dillon is spending the 1991-92 academic year on sabbatical leave at Michigan State University, East Lansing Michigan. In his position as Visiting Professor and Acting Director of the Beal-Darlington Herbarium, he is teaching graduate and undergraduate courses in botanical systematics and acting as academic advisor to several students. After completion of his sabbatical year, he will return to Field Museum of Natural History in August 1992 to resume his duties as Curator of Vascular Plants.

ADJUNCT APPOINTMENTS:
Universidad Nacional de Cajamarca - Honorary Professor in Education Faculty
Harvard University - Adjunct Research Associate of Arnold Arboretum
Missouri Botanical Garden - Research Associate

TEACHING:
Currently teaching [September 1991-August 1992] in the Department of Botany and Plant Pathology, Michigan State University: Flowering Plant Diversity (Bot 823), Plant Systematics (Bot 318), Botanical Classification and Phylogeny (Bot 803).
Academic Advisor: M.A. Case, K. Matsalleh, T. Barkman.

COMMITTEE MEMBER FOR PhD STUDENTS
Larry Noblick, University of Illinois (Circle Campus)

MICHAEL J. HUFT (Ph.D. 1979, University of Michigan) Visiting Assistant Curator, Vascular Plants; Assistant Curator, Missouri Botanical Garden. Joined Missouri Botanical Garden in 1980; resident at Field Museum since 1981.

CURRENT RESEARCH:
Michael Huft is currently serving on the editorial board of *Flora Mesoamerica*, a collaborative project of the Missouri Botanical Garden, the British Museum (Natural History), and the University of Mexico to catalogue, describe, and identify all vascular plants of Central America and southern Mexico. Since the Field Museum has the best collections of plants from this area, he has the task of serving as a liaison between the collections at the Museum and the many contributors to the Flora and of going over all manuscripts that are submitted and comparing them with the holdings at the Museum to insure against omissions or other errors. He is also writing the family treatment for the Flora of his specialty, the Euphorbiaceae, as well as treatments of numerous smaller groups. In addition to the Flora project, Huft carries out general systematic studies in neotropical Euphorbiaceae and is currently editing a volume based on the "International Conference on the Systematics of the Euphorbiaceae," held at the Missouri Botanical Garden in 1989.

THOMAS G. LAMMERS (Ph.D. 1988, Ohio State University) Assistant Curator, Vascular Plants. Joined Field Museum in 1990.

CURRENT RESEARCH:
Thomas Lammers' research on the classification and evolution of the Campanulaceae continued this year. Work continued on major monographs of the endemic Hawaiian genus *Cyanea* and on the Hawaiian species of *Lobelia*, as well as revisions of the *Wahlenbergia fernandeziana* complex of South America and the Chilean species of *Lobelia* . The treatment of Campanulaceae for the Bishop Museum's new edition of *In Garden's of Hawaii* was completed and submitted. Three new species of Lobelioideae were discovered among herbarium material (two from South America, the other from Hawaii) and written up for publication. With the assistance of Research Assistant Nancy Hensold, chromosome numbers were determined from Lammer's recent collections in Chile and Hawaii. A manuscript based on the former was submitted for publication; publication for the latter awaits submission of additional material from collectors there. Further, a major review of chromosome numbers and cytological evolution among Lobelioideae was nearing completion at year's end. Four other shorter papers, on various topics, were also completed and submitted for publication this year. During the year, Lammers was invited to contribute treatments of the Campanulaceae to floristic projects covering North America, the Greater Antilles, and the Philippines.

GREGORY M. MUELLER (Ph.D. 1982, University of Tennessee) Assistant Curator, Mycology. Joined Field Museum in 1985.

CURRENT RESEARCH:
Gregory Mueller's research program centers on studies aimed at increasing our understanding of the systematics, ecology and evolution of higher fungi, especially mushrooms (Agaricales) that form ectomycorrhizae. Current work includes (1) a project aimed at investigating generic and species composition, distribution, and degree of endemism of the fungi forming ectomycorrhizae with oaks and pines in Central America and (2) a multifaceted project using the genus *Laccaria* to test various theories of speciation, coevolution (with their obligate tree symbionts), and mycogeography of ectomycorrhizal fungi. Field work for these studies are now centered in Costa Rica and Honduras. Ongoing laboratory studies include obtaining sequence data of rDNA to develop a robust hypothesis of phylogeny for *Laccaria* as well as further studies on determining the concordance between morphological mating, and molecular data. These interrelated projects are providing information on fungal ecology and biology that are crucial to tropical forest management and conservation.

ROBERT G. STOLZE (B.S. 1949, Notre Dame) Associate Curator, Pteridophytes. Joined Field Museum in 1963.

CURRENT RESEARCH:
Robert Stolze is more than three-quarters of the way through the 6-year project "Pteridophyta of Peru" being co-authored with Professor Rolla M. Tryon, of Harvard University, now associated with South Florida University, Tampa. Of the six scheduled fascicles, parts 1, 2 and 4 have been published in *Fieldiana*. Part 3 was delayed because of other commitments on the part of Alan Smith (the major contributor), but is now in press. Part 5 is completed and being prepared for review. About 100 genera and 1000 species will have been treated, and a comprehensive index and phytogeography of the region will appear with the final part, scheduled for completion the end of 1992 with publication in 1993.

DEPARTMENT OF GEOLOGY

JOHN R. BOLT (Ph.D. 1968, University of Chicago) Curator, Fossil Reptiles and Amphibians. Joined Field Museum in 1972.

CURRENT RESEARCH:
John Bolt, in collaboration with Eric Lombard of the University of Chicago is continuing his research on the origin and evolution of early tetrapods, concentrating on well-preserved Mississippian (ca. 340 million yrs. before present) tetrapods he recently collected near the southeastern Iowa town of Delta. The Delta site is the oldest tetrapod-producing locality in the United States and one of the oldest in the world. The Delta collection represents the largest number of well-preserved specimens (over 600) of any locality of roughly comparable age. At least three new taxa are present--which represents an increase in the number of known Mississippian tetrapod genera of about 20%. The morphology and relationships of the earliest tetrapods are poorly understood at present largely because there are few well-preserved and well-prepared specimens available for study. The Delta protoanthracosaur is of particular interest, as it is abundant and apparently represents a very primitive group related to reptiles, birds and mammals. Bolt and Lombard are now writing up a formal description of this animal, and descriptions of other Delta tetrapods will follow. They are also engaged in an ongoing project to critically analyze the relationships of all basal tetrapod groups. Results from the Delta tetrapods will be very important to this project. Bolt has in progress (with Dr. H.-P. Schultze of the University of Kansas) a description of the Mississippian lungfish *Tranodis*, found at both Delta and southern Illinois Mississippian site recently excavated by Schultze. This paper will also contain a brief description of a microsaurian amphibian (the oldest known) collected by Schultze, and comparisons of the Delta tetrapod fauna with that from Schultze's Illinois site.

ADJUNCT APPOINTMENTS:
Member, Committee on Evolutionary Biology, University of Chicago.
Adjunct Associate Professor, Department of Geological Sciences, University of Illinois at Chicago

PETER R. CRANE (Ph.D. 1981, University of Reading, U.K.) Chairman and Curator, Paleobotany. Joined Field Museum in 1982.

CURRENT RESEARCH:
Research on the early diversification and fossil history of flowering plants (angiosperms) has continued and several new types of fossil flowers have been

recognized from the Cretaceous of eastern North America and Portugal. These discoveries have important implications for understanding the origin of flowers and the evolution of floral form in many living groups. Initial results are now being tested using molecular evidence on phylogenetic relationships among angiosperms in collaboration with Dr. Sara Hoot, a post-doctoral scholar in the Department of Geology. Additional collaborative research with Dr. Paul Kenrick (also a post-doctoral scholar) has focussed on integrating knowledge of living and fossil material toward clarifying the early radiation of land plants. During 1991 Crane served as a member of the Editorial Boards of Review of Palaeobotany and Palynology, International Journal of Plant Science, Plant Systematics and Evolution, and the Kew Bulletin.

ADJUNCT APPOINTMENTS
Member Committee on Evolutionary Biology, University of Chicago
Research Associate (Professor), Geophysical Sciences University of Chicago
Lecturer, Biological Sciences Collegiate Division, University of Chicago
Adjunct Professor, Botany, University of Massachusetts

TEACHING:
Animal and Plant Diversity, University of Chicago
Ph.D. thesis committee for Paul Markwick, University of Chicago
Ph.D. thesis committee for Jane Masterson, University of Chicago
Ph.D. thesis committee for Yao Yiping, University of Chicago

JOHN J. FLYNN (Ph.D. 1983, Columbia) Associate Curator, Fossil Mammals. Joined Field Museum in 1988.

CURRENT RESEARCH:
John Flynn continues integrating a wide variety of geologic techniques (including paleomagnetic analyses performed in the new Field Museum Paleomagnetics Laboratory) in studies of geologic time, plate tectonics, and mammalian evolution. In South America, Flynn is completing a study (funded by the National Science Foundation) of the geochronology of strata containing 10-20 million year old mammalian faunas (Colombia and Chile). He is continuing work on an exciting discovery (now funded by the National Science Foundation, preliminary work funded by the National Geographic Society) of a new 30 million year old mammal fauna from the high Andes of central Chile, on the flanks of Volcan Tinguiririca. This represents a new Land Mammal Age, partly filling a previous gap of 15 million years in our knowledge of the South American fossil mammal fauna. It contains the oldest fossil rodent from South America. He is also working on a project (Eppley Foundation) on a new 15-20 million year old terrestrial mammal and marine fauna from Chile, in which it is possible to constrain the timing and rate of uplift of the southern Andes Mountains. He has started reconnaisance work (National Geographic)

collecting fossil pinnipeds (seals & sea lions) and birds from 10-15 million year old marine deposits of coastal northern Chile. Flynn continues to pursue his interest in carnivore evolution and phylogeny. He has a chapter in press on early fossil Carnivora for a book to be published by Cambridge University Press. He presented a paper on carnivore evolution for a June 1990 international symposium sponsored by the Werner-Gren Foundation and American Museum. This paper will be published in a Springer-Verlag volume in 1992. He submitted a 2-year research proposal to the Systematic Biology program of the National Science Foundation, entitled "Phylogeny of the Carnivora (Mammalia): integrating molecular and morphological approaches".

ADJUNCT APPOINTMENTS:
Member, Committee on Evolutionary Biology, University of Chicago;
Lecturer, Biological Sciences, Collegiate Division, University of Chicago;
Faculty Participant, Geophysical Sciences, Paleontology and Stratigraphy Program, University of Chicago;
Research Associate, American Museum of Natural History;
Adjunct Faculty, Rutgers University.

TEACHING:
Mammalian Evolution, University of Chicago;
Ph.D. thesis committee for John Alroy, University of Chicago;
M.S. thesis committee for Pam Austin, University of Illinois at Chicago;
Ph.D. advisor for Greg Buckley, Rutgers University;
Ph.D. thesis committee for Tim Gaudin, University of Chicago;
Ph.D. thesis committee for Javier Guerrero-Diaz, Duke University;
Sponsor for Field Museum summer intern Robin Habegger, University of Colorado;
Ph.D. thesis committee for Bill Stevens, University of Chicago.

LANCE GRANDE (Ph.D. 1983, City University of New York / American Museum of Natural History) Associate Curator, Fossil Fishes. Joined Field Museum in 1983.

CURRENT RESEARCH:
Lance Grande's long-term research program continues on the origin, early evolution, and historical biogeography of actinopterygian (ray-finned) fishes, a group containing nearly half of all vertebrate animals. Including both fossil and living species in his work gives him a broad interdisciplinary perspective on this problem. His goal is to integrate data from comparative anatomy, ontogeny (development), geographic distribution and paleontology, using an abundance of newly discovered fossils as well as fossil and living specimens prepared using the most modern techniques. In this way he can attempt to present an evolutionary picture of early actinopterygians in a relatively clear and comprehensive way. He has collaborated with Willy Bemis from the University

of Massachusetts on much of this work. This work has been, and continues to be, generously supported by the National Science Foundation (one major grant for work on sturgeon and paddlefishes from 1988-1991 and another for work on bowfins and other halecomorph fishes awarded for 1992-1995).

ADJUNCT APPOINTMENTS:

Research Associate, Department of Vertebrate Paleontology, American Museum of Natural History;
Member, Committee on Evolutionary Biology, University of Chicago;
Lecturer, Biological Sciences Collegiate Division, University of Chicago;
Visiting Associate Professor, University of Illinois at Chicago

TEACHING:

Evolution and Osteology of Teleost Fishes, University of Chicago; Biohistory: Ontogeny, Phylogeny and Paleontology, University of Illinois at Chicago; Ph.D. thesis committee for Terry Grande, University of Illinois at Chicago.

SCOTT LIDGARD (Ph.D. 1984, Johns Hopkins University) Associate Curator, Fossil Invertebrates. Joined Field Museum in 1984.

CURRENT RESEARCH:

Clade replacement is a fundamental part of the history of life. It can be viewed as a change in global ecological dominance that can only be recognized in the fossil record, for example, as dinosaurs replaced mammals or clams replaced brachiopods. He has been analyzing one of the most striking yet most poorly documented episodes of clade replacement in the fossil record --- the decline of the diverse cyclostome Bryozoa and the rapid radiation of cheilostome Bryozoa. These clades are closely related phylogenetically, and their ecological similarities led many workers to infer a competition-based mechanism for the replacement. The decline in cyclostome species percentages could occur as a decline in the number of cyclostomes within assemblages that maintain an equilibrium diversity (consistent with competitive displacement), a stable diversity of cyclostomes accompanied by increasing cheilostome diversity (overall species addition), or some combination of these factors. Preliminary results indicate that the dynamics of bryozoan clade replacement are far more complex than previously assumed, involving some elements of competition, but also an increase in assemblage diversity, suggesting that the evolving cheilostomes may have exploited new ways of making a living. Lidgard is also pursuing two other grant-funded research projects: (i) comparing the morphological evolution of bryozoan colonies to that of individual zooids which together form the colonies, and (ii) quantifying the biogeographic pattern of the radiation of flowering plants and its consequences for global terrestrial floras.

ADJUNCT APPOINTMENTS:
Member, Committee on Evolutionary Biology, University of Chicago
Lecturer, Biological Sciences Collegiate Division, University of Chicago

TEACHING:
Animal and Plant Diversity, University of Chicago
Ph.D. thesis committee for Paul Markwick, University of Chicago

MATTHEW H. NITECKI (Ph.D. 1968, University of Chicago) Curator, Fossil Invertebrates. Joined Field Museum in 1965.

CURRENT RESEARCH:
Nitecki's research concentrates on two areas: (1) Problems in the analysis of the cyclocrinitid morphology, which is a part of the long-term project on the evolution, morphology, and systematics of problematic lower Paleozoic cyclocrinitid algae; and (2) the nature of receptaculitids from Sweden and the Baltic provinces of the USSR, which is also part of a long-term study of the paleobiology of receptaculitid problematic fossils. Nitecki is currently pursuing these research interests during a period of research at the University of Oslo, Norway, supported in part by the Norwegian Science Foundation. Nitecki has also been responsible for the Spring Systematics Symposium, now in its 15th year. The series supports two major functions of museums: the discovery of new and important theoretical knowledge and the dissemination of this knowledge to the scientific community. The 1991 symposium was concerned with understanding the origin of anatomically modern humans. Nitecki has served as editor of the Palaeontological Journal since 1988.

ADJUNCT APPOINTMENTS:
Member, Committee on Evolutionary Biology, University of Chicago;
Lecturer, Biological Sciences Collegiate Division, University of Chicago

TEACHING:
Introduction to Evolutionary Biology, University of Chicago

OLIVIER RIEPPEL (Ph.D. 1978, University of Basel, Switzerland) Curator, Fossil Amphibians and Reptiles. Joined Field Museum in 1990.

CURRENT RESEARCH:
Olivier Rieppel continues to study skeleton formation in extant reptiles. Manuscripts on two lizards as well as on the astragalus of amniotes have been submitted. Investigations are now concentrating on patterns of ossification in the turtle *Chelydra serpentina*, and in *Alligator*. Studies in the philosophy and

methodology of systematics and its relations to evolutionary theory have led to the submission of papers on homology, historical and conceptual aspects of comparative biology, and the meaning of cladistics for paleontology. Papers still in progress concern the relation of embryonic development to evolution, and the "species"-problem. Fieldwork during 1991 involved a pioneering trip to explore Lower and Middle Triassic marine deposits in northwestern Nevada. A new locality has yielded important fossil remains including taxa as yet unknown for the United States or even the New World.

ADJUNCT APPOINTMENTS:
Lecturer, Committee on Evolutionary Biology, University of Chicago.
Adjunct Professor, Department of Biological Sciences, Northwestern University.

TEACHING:
Biology of the Amphibians and Reptiles, University of Chicago;
Evolutionary Morphology of Vertebrates, Northwestern University.

DEPARTMENT OF ZOOLOGY

RUDIGER BIELER (Ph.D. 1985, University of Hamburg), Assistant Curator, Invertebrates. Joined Field Museum in 1990.

CURRENT RESEARCH:
Bieler continues research on the evolution, comparative anatomy, zoogeography and reproductive biology of marine gastropods and bivalves. Special emphasis is placed on the "higher-level" phylogenetic relationships between the various gastropod orders and subclasses, where Bieler's research is stimulating the current discussion of gastropod phylogeny. The established text-book classifications of the class Gastropoda are now recognized as not reflecting historical patterns of evolution. With his newly established histology laboratory, comparative fine-morphological studies of "worm-snail" anatomy are underway, based on material collected during fieldwork concentrating on the subtropical western Atlantic. Worm-snails, a group of enigmatic relationship in the gastropods and thus of major interest in the study of the evolution of the class, are of great importance as natural reef builders in the world's oceans, but have previously remained virtually unstudied. Most of the recently collected specimens, even from relatively well-known areas such as Florida, have proved to be previously undescribed species which are being monographed to form a basis for future zoogeographic and phylogenetic studies. Current joint projects with colleagues from other research institutions include electrophoretic methodology to approach species-level taxonomic questions in worm-snails. Another project is the first phylogenetic analysis of the relationships within the bivalve family Galeommatidae, subject of Bieler's earlier biological and anatomical studies. A surprising recent discovery was the occurrence of mating behavior in these snail-like clams, a feature otherwise unknown in the class.

ADJUNCT APPOINTMENTS:
Adjunct Assistant Professor, Graduate College of Marine Studies, University of Delaware, Lewes, DE.
Research Associate, Division of Mollusks, National Museum of Natural History, Smithsonian Institution, Washington,DC.
Research Associate of Malacology, Museum of Comparative Zoology, Harvard University, Cambridge, MA.

BARRY CHERNOFF (Ph.D) 1983, University of Michigan), Associate Curator. Joined Field Museum in 1987.

CURRENT RESEARCH:
Barry Chernoff's research includes studies of silverside fishes, family Atherinidae, and tetras from freshwatersof South America, order Characiformes. This portion of his research program emphasizes the phylogenetic relationship, historical biogeography, morphological differentiation in relation to environmental gradients, and species boundaries. These studies are important because they are altering our view of the systematic structure of major groups of fishes, and also modifying our thoughts about historical patterns of evolution in the New World. Furthermore, these studies contribute to conservation efforts associated with saving the aquatic resources of Central and South America. Much of the data from the silverside and tetra research fits into the second phase of Chernoff's studies on the theory and methodology of morphological evolution. He is completing his studies on mathematical relationships between the molecular clock and the geometry of evolutionary trees. He continues to implement studies on the phylogenetic implications of developmental factors and ontogenetic covariance. In collaboration with other colleagues he is completing a study on the concept of species.

ADJUNCT APPOINTMENTS:
Member, Committee on Evolutionary Biology, University of Chicago

TEACHING:
Systematic Biology, University of Chicago Advanced Studies in Quantitative Morphology, University of Chicago Morfologia Evolutiva, Universidad Central de Venezuela

LAWRENCE R. HEANEY (Ph.D. 1979, University of Kansas), Associate Curator, Mammals. Joined Field Museum in 1988.

CURRENT RESEARCH:
Lawrence Heaney's research centers on patterns of mammalian diversity, with a special interest in island ecosystems and their conservation. His long-term studies on the origin, evolution and ecology of mammals in Southeast Asia are continuing, with specific studies resulting in eight publications in press on the topics of conservation status of Philippine mammals, the diversity of the exceptionally varied and striking Philippine rodent fauna, the biogeography of Philippine insectivores, genetic variation in Philippine fruit bats, and the embryology of a dwarf fruit bat. Projects nearing completion are an identification guide to the bats of the Philippines, a summary of extensive

comparative study of the mammals on three islands in the central Philippines and an extensively annotated bibliography of publications on the conservation of Philippine vertebrates. On-going projects include detailed assessment of genetic variation and its relationship to the history, size, and isolation of the islands on which the animals occur, and the ecology of extinction. In 1992, the research team will inventory the fauna of a national park in Mindanao, and will continue extensive training of Filipino biologists both in the Philippines and Chicago with funding from the MacArthur Foundation. These studies are carried out in collaboration with the Philippine National Museum, Philippine Parks and Wildlife Bureau, and two Philippine universities. During 1991, Heaney presented lectures on mammalian diversity and conservation in Malaysia and the Philippines, and at one national meeting.

ADJUNCT APPOINTMENTS:
Member, Committee on Evolutionary Biology, University of Chicago;
Research Associate, Smithsonian Institution;
Honorary Curator, Philippine National Museum.

TEACHING:
Philippines - "Field Studies in Vertebrate Diversity and Conservation" Spring 1991

ROBERT F. INGER, (Ph.D. 1954, Chicago) Curator, Amphibians & Reptiles. Joined Field Museum in 1946.

CURRENT RESEARCH:
Inger's research is centered on the systematics and evolution of communities of amphibians and reptiles in Bornean forests, a long-range program involving field and laboratory work. Although a primary goal has been the analysis of variation of these communities in primary rain forest, work has been expanded to investigate the effects of selective logging. The expansion not only will help in understanding processes affecting variation in the communities of pristine forests, but also contribute to the growing science of conservation biology. The ecological aspects of this work are a joint effort with Harold Voris.

ADJUNCT APPOINTMENTS:
Member, Committee on Evolutionary Biology, University of Chicago.
Honorary Curator of Reptiles, Sarawak Museum.

JOHN KETHLEY, (Ph.D. 1969, University of Georgia), Associate Curator, Insects. Joined Field Museum in 1970.

CURRENT RESEARCH:
John Kethley's current research involves the systematics and ecology of deep soil mites, especially early derivative taxa. Specific results include publication of: 1) the description of juvenile sexual dimorphism in a group of early derivative soil mites; 2) a new procedure for collecting the inactive stages of deep soil microarthropods. Two other papers: 1) documenting a bizarre life history pattern in deep soil mites; 2) a review and synthesis of the modes of reproduction of prostigmatid mites from a phylogenetic perspective, are in press. Kethley continued collaboratiave research with Dr. M. Kaliszewski, Brigham Young University, on the phylogeny of mites and arachnids using molecular data. Preliminary results based on sequences from nearly 50 taxa were presented at a symposium at a national meeting. These data formed the basis for a proposal submitted to NSF to extend the study for a three year period.

ADJUNCT APPOINTMENTS:
Lecturer, Ohio State University, University of Chicago

TEACHING:
Systematics and phylogeny of prostigmatid mites in Soil Acarology, Medical and Veterinary Acarology, and Agricultural Acarology, Summer Institute of Acarology, Ohio State University.

SCOTT LANYON (Ph.D. 1985, Louisiana State University) Associate Curator, Birds and Chairman, Department of Zoology. Joined Field Museum in 1985.

CURRENT RESEARCH:
Scott Lanyon continues to concentrate his research efforts on the elucidation of phylogenetic relationships within the New World Blackbirds (Icterinae). Within this assemblage of some 97 species it is possible to find examples of virtually every behavior pattern known to occur within song birds: monogamy, polygyny, promiscuity, delayed maturation, sexual size dimorphism, sexual dichromatism, brood parasitism, vocal mimicry, territoriality, coloniality, extensive geographic variation, etc. As interesting and as well studied as this group is, no phylogeny depicting the geneological relationships between the component species and genera has been proposed for the group. Lanyon has completed his first attempt at reconstruction on the phylogeny of this assemblage, using allozyme, DNA, an cranial characters. He is in the process of writing up these results. He will refine this estimate of evolutionary history with additional DNA sequence information and with a survey of additional species. A second aspect of Lanyon's research

program concerns the philosophy and methodology of phylogeny reconstruction. He has completed the development of computer algorithms for summarizing results from studies of independent sets of systematic characters and has submitted the manuscript. Lanyon is also working with Barry Chernoff and Steve Ashe on a manuscript concerning the nature of "species".

ADJUNCT APPOINTMENTS:
Member, Committee on Evolutionary Biology, University of Chicago.
Adjunct Professor, Illinois State University.

TEACHING:
Reading courses in systematics, The University of Chicago.

Major Professor for:
Hector Colon, University of Chicago: Reproductive altruism in the Tody (Aves, Coraciiformes).
Thomas Schulenberg. University of Chicago: Phylogeny and adaptive radiation of the Vanga Shrikes of Madagascar.
John Harshman, University of Chicago: Phylogenetic Relationship an Evolution in the Anseriformes.

ALFRED F. NEWTON, JR. (Ph.D. 1973 Harvard), Associate Curator, Insects. Joined Field Museum in 1985.

CURRENT RESEARCH:
Newton's current research revolves around studies on the evolution of the large beetle family Staphylinidae (over 45,000 named species). He continues a long-term study of the higher-level classification and evolution of the group by focusing on reconstructing the phylogeny of one of the family's four main lineages. With the aid of a 3-year NSF grant initiated in late 1989, he is completing a monographic study of the 185+ New World species of the genus Platydracus, whose species promise to be of special interest for understanding the origin of current distribution patterns of forest-dwelling insects in Mexico and Central America. He continues collaboration with M.K. Thayer on another long-term project, improving knowledge of the staphylinoid beetle fauna of Australia and other southern temperate areas, with the ultimate aim of using this group to help understand the origin of southern disjunct distribution patterns (Australia + New Zealand + Chile) that are very common within the group. He is also assisting J.F. Lawrence (CSIRO, Australia) in completing a review of the current classification and names of the 500+ families and subfamilies of all beetles, and helped organize and instruct a workshop on beetle larvae held in Honolulu in June.

BRUCE D. PATTERSON (Ph.D. 1981, New Mexico State) Associate Curator, Mammals. Joined Field Museum in 1981.

CURRENT RESEARCH:
Patterson's research program centers on the ecology, evolution, and distribution of South American mammals. During the last year, he completed several articles that help to describe and document the world's most diverse biota and to understand its spatial and temporal dimensions: (1) he completed a catalogue of Amazon Basin fauna based on collections made in the 1930's, (2) using DNA sequence analysis, he investigated patterns of genetic differentiation in fig-eating bats (*Artibeus*) in the Amazon Basin, Atlantic Forest, and Western Andean Slope subregions of South America; (3) he discovered and described a new genus and species of long-clawed mouse from temperate rain forests in Chile; and (4) using detailed Pleistocene and modern records of mountaintop mammals in the American Southwest, he analyzed patterns of Holocene extinctions for their relevance to biogeographic theory and conservation practice. Two expeditions to southeastern Brazil are planned in 1992, one in collaboration with Emeritus Curator Hershkovitz. A new research award from NSF is being used to examine various ecological communities for "nested subset" patterns of distribution and to explore the theoretical implications of this type of community structure.

ADJUNCT APPOINTMENTS:
Member, Committee on Evolutionary Biology, University of Chicago;
Adjunct Professor, Department of Biological Science, University of Illinois, Chicago;
Adjunct Professor, Department of Biological Sciences, Northern Illinois University.

TEACHING:
Division of Biological Sciences, University of Chicago & University of Illinois at Chicago;
Rodent Diversity-independent readings; University of Chicago:
BioSci 255,
Biogeography.

JANET VOIGHT (Ph.D., 1990, University of Arizona), Assistant Curator of Invertebrates. Joined Field Museum in 1990.

CURRENT RESEARCH:
Voight continues her research to define and try to resolve evolutionary patterns in the Icirrate (finless) octopods. Morphometrics, a technique pioneered in the study of vertebrates, has proven extremely useful in offering new insight in

incirrate octopod evolution. Current research tests whether these quantitative techniques are equally useful in the study of cirrate octopods, squids, and whether they are applicable to other soft-bodied invertebrate groups. Work on reconstructing phylogenetic relationships of incirrate octopods continues; the first complete set of hypothesized relationships of all genera in the suborder will result. Work on the Squid family Gonatidoe, a family that dominates the North Pacific Ocean has begun. This research promises insight into the radiation of a single squid lineage in a area plus its apparent colonization of other highly productive oceanic areas.

HAROLD K. VORIS, (Ph.D. 1969, University of Chicago) Curator, Amphibians and Reptiles. Joined Field Museum in 1973.

CURRENT RESEARCH:
Harold Voris is currently pursuing three research topics, all based in Southeast Asia. In the lowland tropical rain forest of Borneo, he is studying the natural changes in communities of amphibians and reptiles that occur over time, and differences in these communities that occur from place to place. Recently, comparisons between logged forests and undisturbed forests are adding another dimension to the comparisons. In the Pulau Tiga marine park off the north coast of Borneo, Voris is studying the ecology of the banded sea krait, and amphibious sea snake. Population size estimates were completed and work on the thermal ecology of the sea krait is now under way. In southern Thailand a project on the edible crab and barnacles that live on the gills of the crabs was successfully completed. A paper on the age of colonization has been accepted for publication.

ADJUNCT APPOINTMENTS:
Member, Committee on Evolutionary Biology, University of Chicago.

MARK WESTNEAT (Ph.D. 1990, Duke University), Assistant Curator, Division of Fishes. Joined Field Museum in 1991.

CURRENT RESEARCH:
Mark Westneat's interests lie in the integration of phylogenetic systematics with comparative biomechanics and functional morphology. His research goals in systematics include the resolution of relationships among species and higher level taxa in the fishes of the tropical, marine family Labridae (the wrasses). Character analysis of labrid fishes to date has followed a traditional morphological focus, but data are now being sought from color patterns, behavior, function, and perhaps molecules in an attempt to establish a broad character data base to aid tree construction among the 600 labrid species. The functional morphology of

feeding and locomotion in living fishes is being studied by high speed film and video analysis of behavior. Using comparative anatomy, theory from mechanical engineering, and new image and motion analysis techniques, the musculoskeletal mechanisms of feeding and swimming are being described in fishes of the Labridae, Carangidae, and Scombridae. The goal is to document the mechanisms of force transfer from muscle through connective tissue to skeleton in feeding and locomotor systems. Combined with a phylogenetic hypothesis, this research program tries to clarify the patterns of evolution of functional systems in fishes. Collaborative projects include the ontogeny of muscular motor patterns in mammalian suckling and chewing, and the biomechanics of head and beak motion during song production in sparrows.

COLLECTIONS AND RESEARCH

RESEARCH ASSOCIATES, FIELD ASSOCIATES, ASSOCIATES
1991

Department of Anthropology

Associates

Dorothy Baumgarten, A.A.
Asian Material Culture

Louva Calhoun, B.F.A.
Anthropology

Sol Century, B.S.
Asian Material Culture

Connie Crane, A.B.
North American Ethnology

Patricia Dodson, M.A.
Latin American Archaeology & Ethnology

Jane Levin, B.S.
North American Archaeology

Elena Kourembana Lincoln, M.A.
Mayan Archaeology

Carolyn Moore, B.A.
Asian Material Culture

Col. Millard E. Rada, E.E.
Museology

Llois Stein
Oceanic Material Culture

Research Associates

Dean E. Arnold, Ph.D.
Mesoamerican and South American Archaeology and Ethnology

Eloise Richards Barter, M.A.
North American Ethnography

Brian Bauer, Ph.D.
Andean Archaeology

Robert J. Braidwood, Ph.D.
SW Asia and Old World Archeology

James A. Brown, Ph.D.
North American Archaeology

Patrick H. Carmichael, Ph.D.
South American Archaeology and Ethnology

William J. Conklin, M.A.
Peruvian Architecture and Textiles

Phillip J. C. Dark, Ph.D.
African Ethnology

Jack L. Davis, Ph.D.
Mediterranean Archaeology

Richard De Puma, Ph.D.
Etruscan Archaeology

Robert Feldman, Ph.D.
Andean Archaeology

Paul S. Goldstein, Ph.D.
South American Archaeology

Gray Graffam, Ph.D.
Andean Archaeology

Chuimei Ho, Ph.D.
East & SE Asian Archaeology & Art History

Bill Holm, M.F.A.
Northwest Coast Indian Art and Material Culture

F. Clark Howell, Ph.D.
Old World Prehistory

Maxine Kleindeinst, Ph.D.
Old World Prehistory

Alan L. Kolata, Ph.D.
Andean & Mesoamerican Archaeology & Ethnohistory

Lyle Konigsberg, Ph.D.
Physical Anthropology

Charles E. Lincoln, Ph.D.
Mayan Studies

Michael E. Moseley, Ph.D.
South American Archaeology

Charles R. Ortloff, M.Ae.E.
Peruvian Archaeology

Robert B. Pickering, Ph.D.
Human Osteology

George I. Quimby, M.A.
Museology and North American Culture History

David Reese, Ph.D.
Archaeozoology & Paleomalacology

Johan G. Reinhard, Ph.D.
Nepal, Bolivia, and Peru

Mario A. Rivera, Ph.D.
South American Archaeology

Fred H. Smith, Ph.D.
Physical Anthropology

Robin Torrence, Ph.D.
Aegean & Pacific Archaeology & Ethnohistory

Patricia Wattenmaker, Ph.D.
Near Eastern Archaeology

Ronald L. Weber, Ph.D.
Amazon Basin & NW Coast U.S. Arch. and Ethnology

Department of Botany

Associate

Betty Strack, M.S.
Mycology

Field Associates

Sandra Knapp, Ph.D.
Vascular Plants

David P. Lewis, M.S.
Chemistry

Marko Lewis
Bryology

Antonio Molina R., Ing. Agr.
Vascular Plants

Research Associates

Janis B. Alcorn, Ph.D.
Ethnobotany

Robert F. Betz, Ph.D.
Vascular Plants

William T. Crowe, Ph.D.
Archeobotany

Sylvia Feuer-Forster, Ph.D.
Palynology

Robin B. Foster, Ph.D.
Vascular Plants

Jesus Garcia J., Biol.
Mycology

Nancy Garwood, Ph.D.
Vascular Plants

Sidney F. Glassman, Ph.D.
Vascular Plants

Luis D. Gòmez, Ph.D.
Vascular Plants

Timothy J. Killeen, Ph.D.
Vascular Plants

Jorge Gomez-Laurito, B.S.
Vascular Plants

Blanca Leon
Pteriodology

Rogers McVaugh, Ph.D.
Vascular Plants

Cirilo Nelson, Ph.D.
Vascular Plants

Lorin I. Nevling, Jr., Ph.D.
Vascular Plants

Richard W. Pohl, Ph.D.
Vascular Plants

Patricio P. Ponce de Leon, Ph.D.
Mycology

Abundio Sagâstegui, Ph.D.
Vascular Plants,

Isidoro Sanchez V., Ph.D.
Vascular Plants

Pablo E. Sanchez V., M.Sc.
Vascular Plants

Rudolf M. Schuster, Ph.D.
Bryology

Rolf Singer, Ph.D.
Mycology

D. Doel Soejarto, Ph.D.
Vascular Plants

Tod F. Stuessy, Ph.D.
Vascular Plants

Kenneth Young, Ph.D.
Vascular Plants

Department of Geology

Associates

Doris Nitecki, M.A.
Paleontology

Field Associates

Thomas Guensburg, Ph.D.
Fossil Vertebrates

Research Associates

Edgar Allin, Ph.D.
Fossil Vertebrates

David Bardack, Ph.D.
Fossil Vertebrates

William Bemis, Ph.D.
Lungfishes, lower verts.,
Amphibians

Frank Carpenter, Sc.D.
Fossil Invertebrates

Robert Clayton, Ph.D.
Geochemistry

Albert Dahlberg, Ph.D.
Fossil Vertebrates

Andrew Davis, Ph.D.
Geochemistry

Robert DeMar, Ph.D.
Fossil Vertebrates

Daniel Fisher, Ph.D.
Fossil Invertebrates

Catharine Forster, Ph.D.
Fossil Invertebrates

Gary Galbreath, Ph.D.
Fossil Vertebrates

Lawrence Grossman, Ph.D.
Meteoritics

Patrick Herendeen, Ph.D.
Herendeen

Antoni Hoffman, Ph.D.
Fossil Invertebrates

James Hopson, Ph.D.
Fossil Vertebrates

David Jablonski, Ph.D.
Fossil Invertebrates

Michael LaBarbera, Ph.D.
Fossil Invertebrates

Ricardo Levi-Setti, Ph.D.
Fossil Invertebrates

Ernest Lundelius, Ph.D.
Fossil Vertebrates

Frank McKinney, Ph.D.
Fossil Invertebrates

Everette Olson, Ph.D.
Fossil Invertebrates

J. Michael Parrish, Ph.D.
Fossil Reptiles

David Raup, Ph.D.
Fossil Invertebrates

J. John Sepkoski, Ph.D.
Fossil Invertebrates

Paul Sereno, Ph.D.
Fossil Reptiles

Paul Sipiera, Ph.D.
Meteoritics

Joseph V. Smith, Ph.D.
Minerology

Leigh Van Valen, Ph.D.
Fossil Vertebrates

Department of Zoology

Associates

Barbara Brown, B.A.
Primates

Sophie Ann Brunner
Preparation of skeletons

Edward C. Dickinson
Philippine birds

Ingrid Fauci
Maintenance of K.P. Schmidt
Library

Dorothy Karall, B.A.
Illustration

Paula M. Mikkelsen
Marine Mollusks

Anthony Milewski, B.S.
Large mammal
Comparative Ecology

Harry G. Nelson, M.Sc.
Systematics of dryopoid
Coleoptera

Raymond Pawley, B.S.
Herpetology

John A. Wagner, Ph.D.
Insects

Field Associates

Fred Aslin
Land Snails, Geology, Biology

Jan Aslin
Land Snails, Geology, Biology

Barbara Becker, M.A.
Zoological research,
Mammal Expeditions

Susan Davis, M.S.
Neotropical birds

John F. Douglass, M.S.
Naturalist; Expeditions

Teresa Greenfield, Ph.D.
Fieldwork, Fishes

Kiew Bong Heang, Ph.D.
Sea Snakes

Ghazally Ismail, Ph.D.
Sponsors research projects in
Malaysia for FMNH

Robert Izor, B.S
Carnivores of South America

Daryl R. Karns, Ph.D.
Herpetology and community
ecology

Douglas Kelt, B.S.
Chilean mammals

Vince Kessner
Land Snails

Bong Heang Kiew, Ph.D.
Sponsors fieldwork on sea
snakes in Malaysia

Scott Morrow Lindbergh
Mammals

David Matusik
Lepidoptera taxonomy

Edward Moll, Ph.D.
Biology of fresh water turtles

John Murphy, M.S.
Herpetology

Laurie Price
Land Snails

Janice and William Street
Travel adventure book on
an Iranian expedition

Walter Suter, Ph.D
Systematics of
Scymaenidae
(Coleoptera)

Donald Taphorn, Ph.D.
Fishes

Research Associates

Peter L Ames, Ph.D.
Syringeal morphology of
passerine birds

Warren Atyeo, Ph.D
Systematics of Acari

William J Beecher, Ph.D.
Jaw & limb adaptations
among passerine birds

Angelo Capparella, Ph.D.
Neotropical birds

Donald S. Chandler, Ph.D
Systematics of Pselaphidae
(Coleoptera)

Dale Clayton, Ph.D.
Host/parasite coevolution

David R. Cook, Ph.D
Systematics of Acari

Joel Cracraft, Ph.D.
Avian systematics and evolutionary
biology

Gustavo Cruz, M.S.
Marine and freshwater fishes of
South America

Sharon Emerson, Ph.D.
Functional anatomy of anura

John Fitzpatrick, Ph.D.
Birds

Jack Fooden, Ph.D.
Asian primates

Elizabeth-Louise Girardi, Ph.D.
Land Snails

David Greenfield, Ph.D.
Ecology of marine & freshwater
fishes

Bruce C. Jayne, Ph.D.
Marine and estuarian snakes

William B. Jeffries, Ph.D.
Epifauna of sea snakes

Linda K Kinkel, Ph.D.
Ring-billed Gulls

R. Eric Lombard, Ph.D.
Functional anatomy of reptiles

David H. Kistner, Ph.D.
Zoology

Richard E. Lombard, Ph.D.
Herpetology

Peter E Lowther, Ph.D.
Field Museum nest and egg collection

Antonio Machado-Allison
South American Fishes

Patricia McGill-Harelstad, Ph.D.
Behavior and ecology of Herring Gulls

Peter Meserve, Ph.D
Population ecology of small mammals

Debra K Moskovits, Ph.D.
Rainforest tortoises

W. Wayne Moss, Ph.D
Systematics and phylogeny of bird skin parasites

Charles Nadler, M.D.
Sciuridae

Roy A. Norton, Ph.D
Systematics of Acari

Charles Oxnard, Ph.D.
Vertebrate anatomy

Philip D. Perkins, Ph.D
Aquatic Coleoptera

Ronald Pine, Ph.D.
Taxonomy of South American mammals

Stephen Pruett-Jones, Ph.D.
Behavior and ecology of Birds of Paradise

George B. Rabb, Ph.D.
Taxonomy of salamanders: phylogeny of snakes

Charles Reed, Ph.D.
Morphology and evolution of mammals

Eric Allen Rickart, Ph.D.
Biogeography of mammals in Southeast Asia

Scott K. Robinson, Ph.D.
Evolutionary ecology within the Icterinae

H. Bradley Shaffer, Ph.D.
Phylogeny of salamanders

Jennifer M. Shopland, Ph.D.
Birds, ecology of mixed species bird-flocks in the Neotropics

Petra Sierwald, Ph.D.
Systematics, morphology and evolution of spiders (Arachnida: Araneae)

Ronald Singer, D.Sc.
Mammalian anatomy

Donald Stewart, Ph.D.
Myriam Stewart
Napo collections

Robert Stuebing, M.S.
Malaysian ecology

Margaret K. Thayer, Ph.D
Systematics of Staphylinidae (Coleoptera)

Jamie Thomerson, Ph.D.
Central and South American fishes

Robert Timm, Ph.D.
Host parasite relationship in mammals

Richard Wassersug, PH.D.
Tadpole research

John Wible, Ph.D.
Higher level taxonomy of mammals

Glen E. Woolfenden, Ph.D.
Florida Scrub Jay

Guanfu Wu
Chinese fauna, systematics

Chang Man Yang, B.S.
Decapods

Ermi Zhao, Ph.D.
Chinese fauna, systematics

VISITING SCIENTISTS AND CURATORS

Each year there are literally hundreds of students and scientists from around the world who come in to use the Field Museum collections and consult with the curators or professional services staff. The individuals listed below were each working at the Museum for a more extended period of time, ranging from one week to a full year.

Anthropology

Kirsten Anderson, Graduate Student, University of Chicago.
Research of Nazca skeletal material and documentation.

Dr. Hennig Bischof, Director of Anthropology Collections, Volkerkundische Sammlungen der Stadt Manheim Museum für Archaologie.
Examined material and related documentation from Mason excavations.

Marcia-Anne Dobres, Graduate Student, University of California - Berkeley.
Study Upper Paleolithic bones and antlers.

Deborah Jain, Graduate Student, University of Chicago.
Study of Peruvian skeletal material and related documentation.

David Kice, Graduate Student, University of Chicago.
Study of human skeletal material.

Yoshinobu Kotani, Nagoya University, Japan.
Tohru Ikeda, Hokkaido University, Japan.
Hideo Kirikae, Koyama Sita, Japan.
Study of the entire Ainu collection and documentation.

Laurene Lambertino-Urquizo, graduate student, Governors State University.
Research on Mexican pottery collections.

Roger J. Matthews, Director, British School of Archaeology in Iraq.
Survey of Jemdet Nasr collection and documentation.

Dr. Donald McVicker, Professor, North Central College, Illinois.
Research on Mayan pottery.

Dr. Douglas Owsley, Curator, Smithsonian Institution.
Robert Mann, Physical Anthropologist, Smithsonian Institution.
Chip Clark, Photographer.
Analyze Blackfoot and Easter Island crania.

Janet Romanowicz, Graduate Student, New York University.
Study of Upper Paleolithic material from La Roche de Lalinde.

Dr. Daniel Sawyer, Professor, Loyola University Medical Center.
Study of Nazca skeletal material.

Dr. Frank Kurt Tiesler, Curator of the Pacific, Staatliches Museum für Völkerkunde, Dresden.
Study and consultation, Melanesian collection and the A. B. Lewis Project.

Botany

Partha Banerjee, graduate student, Southern Illinois University, Carbondale, IL. Research on agaricales.

Dr. David Boshier, Oxford Forestry Institute, Oxford, England. Research on Cordia (Boraginaceae).

Dr. Timothy Brothers, Assistant Professor, Indiana University, Indianapolis, Indiana. Research on North American prairie flora.

Dr. Renee Fortunato, Instituto de Recursos Biologicos, I.N.T.A., Argentina. Research on Leguminosae/Mimosoids.

Peter Jorgensen, graduate student, Botanical Institute, Aarhus University, Aarhus, Denmark. Research on Dicots of Ecuador Andes.

Dr. Surjit Kaur, National Botanical Research Institute, Lucknow, Uttar Pradesh, India. Research on Lomariopsidaceae.

Blanca Léon, Field Museum Research Associate, Museo de Historia Natural, Lima, Peru. Research on Campyloneurum (Polypodiaceae).

Leticia Pacheco, graduate student, Universidad Autonoma Metropolitana-Iztapalapa, Mexico. Research on Diplazium.

Carmen Ulloa Ulloa, graduate student, Herbario QCA - Pontificia Universidad Catolica del Ecuador, Quito, Eduador. Research on dicots, High Andes, Ecuador.

Paulo Windisch, graduate student, Universidade Estadual Paulista, San Jose do Rio Preto, Brazil. Research on Hymenophyllaceae.

Dr. Kenneth Young, Field Museum Research Associate, Department of Geography, University of Colorado, Boulder, CO and Museo de Historia Natural, Lima, Peru. Research on South American phanerogams.

Geology

Dr. Gloria Arratia, University of Kansas, Lawrence, Kansas
Research visit, study of fossil fishes.

Dr. Jack Bailey, Western Illinois University
Study fossil invertebrate collections.

Dr. Abhijit Basu, Indiana University, Bloomington, Indiana
Use paleomagnetic laboratory facilities.

Dr. Tomasz Baumiller, Ohio State University
Study crinoid and blastoid collections.

Dr. William Bemis, University of Massachusetts, Amherst
Collaborative research with Dr. Grande on the osteology and phylogenetic relationships of fossil and Recent paddlefishes.

Dr. Rachel Benton, Fossil Butte National Monument, Kemmerer, Wyoming.
Learning preparation techniques and collection management.

Dr. Danita Brandt, University of Cincinnati, Cincinnati, Ohio.
Study trilobite collections.

Dr. W. G. Chaloner, University of London
Study paleobotanical collections.

Lisa Chisholm, University of North Carolina
Use of paleomagnetic laboratory facilities.

Dr. Philip Currie, Tyrrell Museum, Alberta, Canada
Study fossil reptile collections.

Paul Davies, University of Bristol, U.K.
Study fossil birds.

Dr. Javier Guererro-Diaz, Duke University
Use of paleomagnetic laboratory facilities.

Dr. Steve Donovan, University of West Indies, Jamaica
Study crinoid collections.

Dr. Thomas Duncan, University of California at Berkeley.
Study paleobotanical collections.

Dr. Catherine Forster, University of Chicago
Collaborative work with Dr. Rieppel. Study fossil reptile collections.
Dr. M. Guntert, Director, Natural History Museum in Berne.
Research on exhibits.

Dr. Andrew Hay, Northeastern Illinois University
Study fossil invertebrate collections.

Dr. Patrick Herendeen, Swedish Natural History Museum
Study paleobotanical collections.

Dr. Andrew Jeram, Ulster Museum
Research on fossil scorpions.

Dr. Gilian M. King, South African Museum, Johannesburg.
Research on Lower Permian mammal-like reptiles.

Dr. R. Eric Lombard, University of Chicago
Collaborative research with Dr. Bolt on the origin and evolution of early tetrapods.

Dr. Richard Madden, Duke University, Durham, North Carolina.
Study fossil mammal collections.

Dr. Shang You Nie, University of Chicago.
Use of paleomagnetic laboratory facilities.

Dr. Roy Plotnick, University of Illinois at Chicago.
Study fossil invertebrate collections.

Dr. Alex Ritchie, Australian Museum, Sydney, Australia.
Study fossil fish collections.

Dr. M. Sander, Postdoctoral Fellow, Palaontologisches Institut der Universitat, Bonn, Germany.
Research on the ultrastructure of reptilian enamel. Fieldwork with Dr. Rieppel.

Dr. Paul Sereno, University of Chicago.
Study fossil reptile collections.

Dr. Stuart Sumida, University of Chicago
Study fossil reptile collections.

Dr. Hans Thewissen, Duke University, Durham, North Carolina.
Study fossil mammal collections.

Dr. Peter Ward, University of Washington, Study fossil invertebrate collections.

Dr. Robin Wass, University of Sydney, New South Wales, Australia.
Study fossil invertebrate collections.

Zoology

Amphibians and Reptiles

Dr. John Cadle, Curator, Amphibians and Reptiles, Philadelphia Academy of Natural Science, Philadelphia, Pa.;
Research on Madagascar herps.

Dr. Sharon Emerson, Adjunct Professor, Department of Biology, University of Utah, Salt Lake City, Utah and Field Museum Research Associate;
Research on southeast Asian frogs.

Larry Frolich, Graduate Student, University of Chicago, Chicago, Illinois;
Research on salamander *Ambystoma*.

Dr. William B. Jeffries, Professor, Department of Biology, Dickinson College, Carlisle, Pa. and Field Museum Research Associate;
Collaborative research with H. Voris on symbiotic relationships.

Dr. Daryl Karns, Professor, Department of Biology, Hanover College, Hanover, Indiana and Field Museum Field Associate;
Research on southeast Asian herps and confer with H. Voris.

Mr. John Murphy, Biology Teacher, Plainfield High School, Plainfield, Illinois and Field Museum Field Associate;
Research on southeast Asian herps and confer with H. Voris.

Mr. Van Wallach, Technical Assistant, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts and graduate student;
Research on blind snakes.

Birds

Mr. John Dumbacher, graduate student, University of Chicago
Research on New Guinea Birds

Mr. John Harshmon, graduate student, University of Chicago
Research on systematics of Anatidae

Mr. H. D. Jackson
Systematics of Caprimulgidae

Mr. Shaibal Mitra, graduate student, University of Chicago

Mr. Jonathan Regosia, graduate student, University of Chicago
Research on Scissor-tailed Flycatcher

Mr. Thomas Schulenberg, graduate student, University of Chicago
Research on birds of Madagascar and South America

Dr. Douglas F. Stotz, Curator of Birds, Museo de Zoologia, Universidade de Sao Paulo, Brasil
Research on Brazilian birds

Fishes

James Albert, University of Michigan;
Research on electric fishes.

Dr. William Bemis, University of Massachusetts - Amherst
Comparative anatomy of fishes.

Mr. William Browne, student intern, University of Chicago;
Research on morphometrics of South American tetras.

Xiaoping Chen, Duke University;
Research on Asian catfish.

Mr. Bryan Dyer, University of Michigan, FMNH student;
Research on silverside fishes.

Dr. Carl Ferraris, American Museum of Natural History;
Research on South American mailed catfishes.

Dr. Julian Humphries, Cornell University;
Research on neotropical fishes.

Dr. Helen K. Larson, Northern Territory Museum of Arts & Science
Research on gobioids.

Dr. Antonio Machado, Research Associate, Professor of Neotropical Zoology,
Universidad Central de Venezuela;
Research on systematics of South American freshwater fishes.

Dr. Sonia Müller, Museum d'Histoire Naturelle - Geneva;
Examination of specimens.

Ms. Jean Porterfield, student intern, Duke University;
Research on histology and morphometrics of Caribbean silverside fishes.

Dr. Jamie Thomerson, Southern Illinois University at Edwardsville
Central & South American fishes.

Ms. Jennifer Wheeler, field assistant.

Insects
Dr. Margaret Thayer, Research Associate
Research on Staphylinid Beetles.

Dr. John E. Rawlins Carnegie Museum of Natural History;
Curation of H. Strecker Lepidoptera collection.

Dr. S. A. Slipinski Polish Academy of Sciences;
Curation and identification of FMNH Coleoptera collection.

Invertebrates

Dr. Robert Cowie, Curator, Bernice P. Bishop Museum;
Research on ampullarid freshwater snails.

Ms. Paula Mikkelsen, Curator, Harbor Branch Oceanographic Museum and Field Museum Research Associate;
Research on opisthobranch molluscs.

Dr. Beata Pokryszko, Curator, Wroclaw University, Museum of Natural History;
Research on Australian pupilloid land snails.

Mammals

Danilo S. Balete, Science Officer, Haribon Foundation, Manila, Philippines;
Internship in Division of Mammals.

Maria Cole, graduate student, SUNY-Stony Brook;
Research on Perissodactla and Artiodactyla skeletons.

Theodore Cole, III, graduate student, SUNY-Stony Brook;
Research on New World monkeys.

Lesa Davis, graduate student, Southern Illinois University;
Research on New World monkeys.

Dr. Rosa Garcia, National Museum of Natural History, Smithsonian Institution;
Research on Felidae.

Pedro C. Gonzales, Curator, National Museum Manila, Philippines;
Research on Birds and Mammals.

Nina Ingle, graduate student, Cornell University;
Research on Asian bats.

Marivene R. Manuel, Researcher, National Museum Manila, Philippines;
Literature search on vertebrates and invertebrates.

Hector C. Miranda, Assistant Professor, Institute of Biological Sciences, University of the Philippines at Los Banos, Philippines.
Internship in the Division of Mammals.

Philip Myers, Museum of Zoology, University of Michigan Ann Arbor;
Research on Nepalese mammals.

Fernando Palacios, Researcher, National Museum of Natural History, Madrid, Spain;
Research on Lepus.

Dr. Matthew J. Ravosa, Research Associate and Visiting Assistant Professor, Duke University Medical Center;
Research on Carnivores.

Dr. Victor Sanchez-Cordero, Researcher, Instituto de Biologia, Universidad Nacional Autonoma de Mexico;
Research on Mexican mammal collection.

Lin Yonglie, Associate Professor, Institute of Zoology, Academia Sinica;
Research on Chinese mammals.

1991 PUBLICATIONS

ANTHROPOLOGY

Bennet Bronson

1991. (with T. Srisuchat, A. Srisuchat, and C. M. Ho) Early Chinese ceramics in Southern Thailand. *Silpakorn, Journal of the Fine Arts Department of Thailand*, 33,4:15-29. Bangkok.

1991. Exhibition Review. The Sculpture of Indonesia and Court Arts of Indonesia. *Museum Anthropology*, 15,3:34-37.

1991. (with Chuimei Ho) A Silk Road in Southern Thailand. *In the Field: The Bulletin of the Field Museum of Natural History*, Sept/Oct: 1&18.

1991. Export Porcelain in Economic Perspective: The Asian Ceramic Trade in the 17th Century. Pp. 126-151 in *Ancient Ceramic Kiln Technology in Asia* (C. M. Ho, ed.). Centre of Asian Studies, University of Hong Kong.

Winifred Creamer

1991. (with J. Haas) Pueblo: Search for the Ancient Ones. *National Geographic*, 180(4):84-99.

Jonathan Haas

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COLLECTION AND RESEARCH

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Ancient Trade at Ko Kho Khao and Laem Pho, Thailand. National Geographic Society. $10,890. February 1990 - June 1991. Co-PI - Chuimei Ho.

Winifred Creamer
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Jonathan Haas
Warfare, Disease, and Colonial Contact in the Pueblos of Northern New Mexico. Harry Frank Guggenheim Foundation. $25,080. October 1989 - March 1991. Co-PI - Winifred Creamer.

Recordation of Human Skeletal Remains Conference. National Science Foundation. $13,180. December 1990 - November 1991.

Chuimei Ho
Ancient Trade at Ko Kho Khao and Laem Pho, Thailand. National Geographic Society. $10,890. February 1990 - June 1991. Co-PI - Bennet Bronson.

Anna Roosevelt
The Developmental Sequence at Santarem on the Lower Amazon, Brazil. National Endowment for the Humanities. 1991 - 1993.

John D. and Catherine T. MacArthur Foundation Prize Fellowship. $265,000. September 1988 - August 1992.

Catherine Sease
Field Museum Conservation Survey. Institute of Museum Services. $25,000. September 1990 - December 1991.

Charles Stanish
Prehispanic State Formation in the Lupaqa Area, Peru. National Science Foundation. $41,405. August 1990 - January 1992.

John Terrell
"Not in Isolation: Regional Studies in Melanesian Anthropology" Conference. Wenner-Gren Foundation for Anthropological Research, Inc. $8,575. April 1990 - December 1991.

Continuity and Change in Exchange Relations on the Aitape Coast of Papua New Guinea. National Endowment for the Humanities. $69,950. August 1991 - July 1992. Co-PI - Robert Welsch.

Robert Welsch
Continuity and Change in Exchange Relations on the Aitape Coast of Papua New Guinea. National Endowment for the Humanities. $69,950. August 1991 - July 1992. Co-PI - John Terrell.

Botany

Michael O. Dillon
Floristic Inventory of Humid Upper Montane Forest of Northern Peru. National Geographic Society Grant. NGS 4510-91. $18,950. 1991-1993.

John J. Engel
Curatorial Support for the Field Museum Herbarium. National Science Foundation Grant. BSR-8801197. $458,883. 1988-1991. Co-PI Christine Niezgoda.

Curatorial Support for the Field Museum Herbarium. National Science Foundation Grant. BSR-9021960. $653,153. 1991-1994. Co-PI Christine Niezgoda.

Restoration of the Berlin Negatives. National Science Foundation Grant. BSR-8913267. $105,000. 1990-1993. Co-PI Christine Niezgoda.

FM ID 90-1028 -- Sub-contract with University of Illinois. 1990-1991. $14,047.

Gregory M. Mueller
Mushrooms and Other Fungi of Costa Rican Oak Forests. The John D. and Catherine T. MacArthur Foundation. 875101. $22,000. 1989-1992.

Christine Niezgoda

Curatorial Support for the Field Museum Herbarium. National Science Foundation Grant. BSR-8801197. $458,883. 1988-1991. Co-PI John Engel.

Curatorial Support for the Field Museum Herbarium. National Science Foundation Grant. BSR-9021960. $653,153. 1991-1994. Co-PI John Engel.

Restoration of the Berlin Negatives. National Science Foundation Grant. BSR-8913267. $105,000. 1990-1993. Co-PI John Engel.

Rudolf M. Schuster

Completion of a Generic/Familial Synthesis of the Hepaticae. National Science Foundation. BSR-8709355. $88,207. 1988-1991.

Publication Subsidy of Vol. V & VI of "The Hepaticae and Antherocerotae of North America." National Science Foundation. BSR-8914364. $17,014. 1990-1992.

Geology

John Bolt

Renovation of Paleontological Research Facilities in the Department of Geology (Co-P.I., John Flynn). National Science Foundation. Amount Awarded (1/91) - Direct: $375,000 Indirect: 0 Total: $375,000

Peter Crane

Global Patterns of Cretaceous Vegetational Change: (Co-P.I., Scott Lidgard) American Chemical Society. Amount Awarded (2/91) - Direct: $40,000 Indirect: 0 Total: $40,000

Systematics, Floral Structure and Reproductive Biology of Mid- Cretaceous Magnoliid Angiosperms. National Science Foundation. Amount Awarded (2/91) - Direct: $127,363 Indirect: $83,560 Total: $210,923

Major Patterns in the Phylogeny of Flowering Plants: Floral Development and Relationships among Basal Non-magnoliid Dicotyledons. National Science Foundation. Amount Awarded (4/91) - Direct: $9,860 Indirect: $2,593 Total: $12,453

Support for NAPC.V - the Fifth North American Paleontological Convention. (Co-P.I.'s - S. Lidgard, S. Kidwell, M. Labarbera, R. Plotnick). National Science Foundation. Amount awarded (1/91 - 12/91) $20,600.00

The Geological History of Polyploidy in Woody Angiosperms. National Science Foundation/Doctoral Dissertation (Co-P.I. Jane Masterson). Amount Awarded (12/91) - Direct: $4,801 Indirect: 0 Total: $4,801

John Flynn
Acquisition of a Video Image Analysis System
Paleomagnetism Laboratory Equipment
Philip M. McKenna Foundation. Amount Awarded (1/91) - Direct: $22,200 Indirect: 0 Total: $22,200

A New Paleogene Fauna from the Chilean Andes: A Critical Interval in South America Mammalian History. University of California/Santa Barbara. Amount Awarded (8/91) - Direct: $8,612 Indirect: $6,388 Total: $15,000.

Paleomagnetism and Tectonics of an Obducted Ophiolite Sequence. University of North Carolina. Amount Awarded (2/91) - Direct: $3,000 Indirect: 0 Total: $3,000

Collaborative Research: A New Paleogene Fauna from the Chilean Andes. American Museum of Natural History. Amount Awarded (7/91) - Direct: $10,650 Indirect: $7,902 Total: $18,552

Renovation of Paleontological Research Facilities in the Department of Geology" (Co-P.I. with John Bolt). National Science Foundation. Amount Awarded (1/91) - Direct: $375,000 Indirect: 0 Total: $375,000

Travel grant to attend 20th General Assembly of the International Union of Geodesy and Geophysics, Vienna, Austria, August 22-24, 1991. National Science Foundation. $800.00

Research in geochronology. Warwick Foundation. Amount awarded (11/90 - 11/91) $1,000.00

Phylogenetic analysis of Carnivora: fossils, morphology, and molecules. FMNH Collections and Research fund. Amount awarded (11/90 - 11/91) $5,000.00

Paleontology and geochronology of the middle Miocene of South America". (P.I. on 3-year sub-contract for paleomagnetic research, from R. Kay, Duke University). National Science Foundation. Amount awarded (12/89 - 12/92). $32,363.00

Paleontology and geochronology of the middle Miocene of South America. (Third year of 3-year sub-contract for paleomagnetic research, from R. Kay, Duke University). National Science Foundation. Amount awarded (7/91 - 7/92) $7,839.00

Grande, Lance

(co-PI with W. Bemis) "Systematics, Ontogeny, Osteology and Historical Biogeography of Paddlefishes (Chondrostei: Polyodontidae)". National Science Foundation. $119,000 total ($36,000 administered by FMNH; $83,000 administered by University of Massachusetts). 1988-1991.

Grossman, Lawrence

Emergency Funding for an Interim Curator of Meteorites. National Aeronautics and Space Administration, Amount Awarded (12/91) - Direct: $22,680 Indirect: $16,829 Total: $39,509

Herendeen, Patrick

Paleobotanical patterns in the evolution of angiosperm secondary xylem and their phylogenetic significance. National Science Foundation, Amount awarded (9/90 - 9/91) $33,006.00

Lidgard, Scott

Comparing Zooid and Colony Evolution in a Modular Organism: Phylogeny and Morphometry in the Cenozoic Bryozoan Adeonellopsis. National Science Foundation. Amount awarded (9/90 - 10/92) $61,519.00

Global Patterns of Cretaceous Vegetational Change. The Petroleum Research Fund, American Chemical Society. Amount awarded (1/91 - 12/92) $40,000.00

Support for NAPC.V - the Fifth North American Paleontological Convention. (Co-P.I.'s - P.R. Crane, S. Kidwell, M. Labarbera, R. Plotnick). National Science Foundation. Amount awarded (1/91 - 12/91) $20,600.00

Masterson, Jane

The Geological History of Polyploidy in Woody Angiosperms. National Science Foundation/Doctoral Dissertation (Co-P.I. Peter R. Crane). Amount Awarded (12/91) - Direct: $4,801 Indirect: 0 Total: $4,801

Olsen, Edward

Trace Element and Isotope Studies in Oxide/Phosphate/Silicate Inclusions. National Aeronautics and Space Administration. Amount awarded (4/89 - 4/91) $31,612.00

Zoology

Barry Chernoff
Support for Computerization and Expansion of Ichthyology collection of the Field Museum of Natural History. National Science Foundation, Biological Research Resources (1991-1994) Total: $368,521.

Lawrence R. Heaney
"Conservation of Mammalian Diversity in the Philippine Islands: Training, Inventory, and Resource Development." MacArthur Foundation. (1990-1993) Total: $295,000

Scott M. Lanyon
Collection computerization. National Science Foundation. BSR-8700341 (#453) (1987 - 1991)

Alfred Newton
Support for the care and use of the collections of insects and other arthropods of the Field Museum of Natural History, Co.PI, John Kethley. National Science Foundation. (1989 - 1994) Total: $710,047

Revision of New World Platydracus species. National Science Foundation. (1989 - 1991) Total: $89,009

Bruce Patterson
Facilities support for the Mammal Collection, Field Museum of Natural History." National Science Foundation. (1989 - 1992) Co-PIs - L. R. Heaney and J. C. Kerbis. Total: $203,714

Nested patterns of species composition in ecological communities. National Science Foundation. (1991 - 1992) Total: $26,000

Margaret Thayer
Phylogeny and reclassification of Omaliini of the World. National Science Foundation. (1988 - 1991) Total: $134,999

H. K. Voris
Support to Enhance the Accessibility of the Herpetological Collections of the FMNH. National Science Foundation. (1991 - 1995) Co-PI, Alan Resetar. Total: $97,554

Photography

Nina Cummings
Preservation of the Photographic Collection. National Endowment for the Humanities, $184,000. Co-PI Catherine Sease, Department of Anthropology. 1989 - 1991.

COLLECTIONS AND RESEARCH

Grant Awards in 1991

Bolt, John; Flynn, John (Geology)
"Renovation of Paleontological Research Facilities
in Department of Geology"
National Science Foundation Total: $375,000

Chernoff, Barry (Zoology)
"Development and Support for MUSE, a microcomputer
-based system for managing natural history collections"
National Science Foundation Total: $145,233

Chernoff, Barry (Zoology)
"Support for Computerization and Expansion of Ichthyology
collection of the Field Museum of Natural History"
National Science Foundation Total: $368,521

Crane, Peter; Lidgard, Scott (Geology)
"Global Patterns of Cretaceous Vegetational Change"
American Chemical Society Total: $ 40,000

Crane, Peter (Geology)
"Systematics, Floral Structure and Reproductive Biology
of Mid-Cretaceous Magnoliid Angiosperms"
National Science Foundation Total: $210,923

Crane, Peter (Geology)
"Major Patterns in the Phylogeny of Flowering Plants:
Floral Development and Relationships among Basal
Non-magnoliid Dicotyledons"
National Science Foundation Total: $ 12,453

Dillon, Michael (Botany)
"Floristic Inventory of Humid Upper Montane Forest
of Northern Peru"
National Geographic Society Total: $ 18,950

Engel, John (Botany)
"Curatorial Support for the Field Museum Herbarium."
National Science Foundation. Co-PI Christine Niezgoda. Total: $653,153

Flynn, John (Geology)
"Acquisition of a Video Image Analysis System"
"Paleomagnetism Laboratory Equipment"
Philip M. McKenna Foundation Total: $ 22,200

Flynn, John (Geology)
"A New Paleogene Fauna from the Chilean Andes: A Critical
Interval in South America Mammalian History"
University of California/Santa Barbara Total: $ 15,000

Flynn, John (Geology)
"Paleomagnetism and Tectonics of an Obducted Ophiolite Sequence"
University of North Carolina Total: $ 3,000

Flynn, John (Geology)
"Collaborative Research: A New Paleogene Fauna
from the Chilean Andes"
American Museum of Natural History Total: $ 18,552

Gross, Christine (Anthropology) 06/91
Care, Maintenance of North American Ethnographic
Textiles, Garments, and Tipi Models
National Endowment for the Arts Total: $ 16,200

Grossman, Lawrence (Geology)
"Emergency Funding for an Interim Curator of Meteorites"
National Aeronautics and Space Administration Total: $ 39,509

Masterson, Jane; Crane, Peter (Geology)
"The Geological History of Polyploidy in Woody Angiosperms"
National Science Foundation/Doctoral Dissertation Total: $ 4,801

Sease, Catherine (Anthropology)
Post-Graduate Internship Program in the Conservation
of Ethnographic Works of Art
National Endowment for the Arts
Total: $ 20,000

Terrell, John (Anthropology)
Continuity and Change in Exchange Relations on the
Aitape Coast of Papua, New Guinea
National Endowment for the Humanities Total: $ 69,950

Voris, Harold K. (Zoology)
"Support to Enhance the Accessibility of the Herpetological Collections of the FMNH. "
National Science Foundation. Co-PI Alan Resetar Total: $ 97,554

Welsh, Robert (Anthropology)
"Continuity and Change in Exchange Relations on the Aitape Coast of Papua, New Guinea"
National Endowment for the Humanities Total: $ 69,950

TOTAL GRANTS AWARDED IN 1991 **$2,200,949**

COLLECTIONS AND RESEARCH

Scientific Travel

Anthropology

Bennet Bronson	
Thailand Fieldwork	January - March 1991
Omaha, NE Consultation at Joslyn Museum	August 1991
Chicago, IL Annual Meeting - American Anthropological Association	November 1991
Christine Del Re	
Albuquerque, NM Annual Meeting - American Institute for Conservation	June 1991
Mochlos, Crete Fieldwork - Worked at the Late Minoan IB Site of Mochlos as field conservator for five weeks. Worked almost exclusively on Minoan pottery.	July - August 1991
Mount Carroll, IL Campbell Center for Historic Preservation Studies - Conservation Course, Microchemical Analysis for Object Conservators	September 1991
Wil Grewe-Mullins	
Denver, CO Annual Meeting - American Association of Museums	May 1991
Chicago, IL Annual Meeting - American Anthropological Association	November 1991
Christine Gross	
Denver, CO Annual Meeting - American Association of Museums	May 1991

Mount Carroll, IL June 1991
Campbell Center for Historic Preservation Studies -
Workshop, "Disaster Mitigation"

Chicago, IL August 1991
Joint workshop, FMNH and Newberry Library,
"Material Culture/Blood of Things"

Chicago, IL November 1991
Annual Meeting - American Anthropological Association

Jonathan Haas

Washington, D.C. February 1991
Annual Meeting - American Association
for the Advancement of Science

Tucson, AZ February 1991
Annual Meeting - Association of Science Museum Directors

Onandaga, NY February 1991
Consultation - Iroquois Nation

New Orleans, LA April 1991
Annual Meeting - Society for American Archaeology

College Station, TX May 1991
Annual Meeting - Association of Systematic Collections

Denver, CO May 1991
Annual Meeting - American Association of Museums

Washington, D.C. July 1991
Consultation - National Museum of the American Indian

New Orleans, LA July 1991
Annual Meeting - International Congress of Americanists

New York, NY October 1991
Research and consultation -
American Museum of Natural History

Sheryl Heidenreich
  Chicago, IL — October 1991
  Annual Meeting - Society for Ethnomusicology

Janice Klein
  Los Angeles, CA — March 1991
  ALI-ABA Course of Study, "Legal Problems of Museum Administration"

  Denver, CO — May 1991
  Annual Meeting - American Association of Museums

  Minneapolis, MN — September 1991
  Annual Meeting - Midwest Museums Conference

Phillip Lewis
  Chicago, IL — November 1991
  Annual Meeting - American Anthropological Association

David Rasch
  Mount Carroll, IL — September 1991
  Campbell Center for Historic Preservation Studies - Course, "Microchemical Analysis for Object Conservators"

  Seattle, WA — September 1991
  Annual Meeting - Western Association for Art Conservation

Karen Poulson
  Chicago, IL — November 1991
  Annual Meeting -American Anthropological Association

Anna Roosevelt
  Washington, D.C. — February 1991
  Annual Meeting - American Association for the Advancement of Science

  New Orleans, LA — April 1991
  Annual Meeting - Society for American Archaeology

  Rio de Janiero, Brazil — September 1991
  Reuniao Cientifica da Sociedad de Arquelogia Brasileira

Washington, D.C. Meeting - Advisory Committee of the National Science Foundation - International Division	October 1991
Washington, D.C. Meeting - Task Force of the Committee on Anthropology and the Environment, American Anthropological Association	October 1991
Chicago, IL Annual Meeting - American Anthropological Association	November 1991
Coro, Venezuela Workshop - Ecological Change in Northern South America	December 1991
Cambridge, MA Annual Meeting - Board of Directors, Latin American Scholarship Program in American Universities	December 1991
Catherine Sease	
Lima, Ilo, Moquegua, Peru; Arica, Chile Consultation - conservation needs for storage facilities	May 1991
Albuquerque, NM Annual Meeting - American Institute for Conservation	June 1991
Mount Carroll, IL Campbell Center for Historic Preservation Studies, Course, "Microchemical Analysis for Object Conservators"	September 1991
Seattle, WA Annual Meeting - Western Association of Art Conservators	September - Oct 1991
Charles Stanish	
Peru Fieldwork	February - Mar 1991
New Orleans, LA Annual Meeting - Society for American Anthropology	April 1991
New Orleans, LA International Congress of Americanists	July 1991

Bolivia Fieldwork	August - Sept 1991
Chicago, IL Annual Meeting - American Anthropological Association	November 1991
John Terrell	
Victoria, British Columbia Annual Meeting - Association for Social Anthropology in Oceania	March 1991
Minneapolis, MN Symposium on the Anthropology of the North Coast of New Guinea	May 1991
James VanStone	
Anchorage, AK Annual Meeting - Alaska Anthropological Association	March 1991
Chicago, IL Annual Meeting - American Anthropological Association	November 1991
Robert Welsch	
Minneapolis, MN Symposium on the Anthropology of the North Coast of New Guinea	May 1991
New York, NY Research - New York Public Library and Missionary Research Library (Union Theological Seminary)	June 1991
Cambridge, MA Research - Harvard University Library	June 1991
Chicago, IL Annual Meeting - American Anthropological Association	November 1991

Botany

William C. Burger	
California, Rancho Santa Ana Botanic Garden, Systematics and Evolution Symposium	May 1991
Texas, American Institute of Biological Sciences Meetings	August 1991
Michael O. Dillon	
Peru,	July 1991.
California, Rancho Santa Ana Botanic Garden, Systematics and Evolution Symposium	May 1991
Texas, American Institute of Biological Sciences Meetings	August 1991
John Engel	
Texas, American Institute of Biological Sciences Meetings	August 1991
Missouri, Missouri Botanical Garden, Systematics Symposium	October 1991
Missouri, Flora North America Advisory Committee Meetings	October 1991
Nancy Hensold	
Ulm, Germany Visiting Scientist at Universitat Ulm, Germany. (Morphology & Systematics of Eriocaulaceae).	January 1991
Panama, General collecting in collaboration with Missouri Botanical Garden.	May-June 1991
New York, Herbarium tour. (Flora of Peru Compositae Checklist).	November-Dec 1991

Thomas G. Lammers	
Tamaulipas, Mexico, Collaborative field work with colleagues from Miami University and Universidad Autonoma do Tamaulipas.	March 1991
Taiwan, Collaborative field work, botanical inventory of Taiwan	September 1991
Honolulu, Hawaii, Pacific Science Congress, invited paper, field work, herbarium study at Bishop Museum.	May-June 1991
Texas, American Institute of Biological Sciences Meetings, contributed paper.	August 1991
Missouri, Missouri Botanical Garden, Systematics Symposium,	October 1991
Gregory M. Mueller	
Honduras, Fieldwork.	July 1991
Costa Rica, Fieldwork.	July 1991
Wisconsin, Stevens Point Biological Station, field work.	September 1991
Texas, American Institute of Biological Sciences Meetings	August 1991
Missouri, Missouri Botanical Garden, Systematics Symposium	October 1991
Christine Niegoda	
Canada, Society for Preservation of Natural History Collections Symposium	May 1991
Missouri, Missouri Botanical Garden, Systematics Symposium	October 1991

Qiuxin Wu	
Wisconsin, Smith Foray, field work.	September 1991
Missouri, Missouri Botanical Garden, Systematics Symposium	October, 1991
Arizona, Annual Meeting of Plant Molecular Biologists, contributed paper.	October, 1991

Geology

John R. Bolt	
Miguasha, P. Q., Canada, 7th International symposium on Studies of Early Vertebrates	June 1991
Ottawa, Canada, Study museum collections of fossil amphibians.	June 1991
Museum of Comparative Zoology, Harvard University, Study museum collections of fossil amphibians.	June 1991
Peter R. Crane	
England Study Museum collection of fossil plants. Invited seminar, Oxford University.	March, 1991
Florida Study museum collection of fossil plants. Invited seminar, University of Florida, Gainesville.	March, 1991
Ohio Attend Mid-Continent Paleobotanical Colloquium, Ohio State University, Columbus.	April, 1991
Virginia Fieldwork, Cretaceous fossil plants.	June, 1991

Montana Fieldwork, Cretaceous fossil plants.	July, 1991
Texas American Institute of Biological Sciences, San Antonio.	August, 1991
British Columbia Fieldwork, Jurassic fossil plants.	August, 1991
Michigan Arrange transfer of Paleobotanical specimens, Michigan State.	September, 1991
Georgia Invited seminar, University of Georgia, Athens.	October, 1991
England Study museum collection of fossil plants.	November, 1991
Denmark Collaborative research, University of Aarhus.	December 1991
John Flynn	
Chile Two independent field research projects.	January 1991
New York Research at the American Museum of Natural History.	May 1991
Wyoming Fieldwork, Washakie and Bridger Basins.	July - August 1991
Austria Present paper, International Union of Geodesy and Geophysics meeting.	
California Present papers, attend project organizing committee meeting at Geological Society of America and Society of Vertebrate Paleontology meetings.	October 1991

Lance Grande

New York, June 1991
Present paper at 71st annual meeting of American Society of Ichthyologists and Herpetologists at the American Museum of Natural History, New York. Study museum collections.

Wyoming, June-July 1991
Field work in Green River Formation.

California, October 1991
Present paper at Society of Vertebrate Paleontology meeting at San Diego Museum of Natural history. Study museum collections.

Germany, November 1991
Present invited paper historical biogeography at international conference in Darmstadt (conference supported). Also spent a few days studying collection at end of trip.

Scott Lidgard

New Zealand, March 1991
New Zealand Oceanographic Institute, Wellington, study collections.

Australia, March 1991
South Australian Museum, Adelaide; University of Sydney, Sydney; National Museum of Victoria, Sydney, study collections and fieldwork.

Toledo, Ohio, April 1991
Invited paper for Geological Society of America meeting.

San Diego, California October 1991
Present paper at Geological Society of America meeting.

Matthew H. Nitecki

Michigan March 1991
Collaborative research at University of Michigan, Ann Arbor

Michigan Arrange for loan of specimens for Spring Systematics Symposium exhibit.	April 1991 May 1991
Norway Recipient of Fulbright Fellowship award. Collaborative research, University of Oslo, Norway.	September-Dec 1991
Edward Olsen	
Washington, D.C. Collaborative research, Smithsonian Institution, Washington, D.C.	January 1991
Texas Attend Lunar and Planetary Science Conference, Johnson Space Center, Houston.	March 1991
Olivier Rieppel	
Ann Arbor, Michigan Invited seminar, Museum of Zoology, The University of Michigan, Ann Arbor.	March 1991
New York Invited seminar to the Systematics Discussion Group at the American Museum of Natural History, New York.	May 1991
Front Royal, Virginia Workshop on Triassic-Jurassic Small Vertebrates, Front Royal, Virginia; organized by Drs. N. Fraser and H.-D. Sues. Presentation of a review of Mesozoic Squamata.	May 1991
Milano, Italy Evolution, Ecology and Biogeography of Triassic Reptiles, Milano; organized by Drs. G. Pinna and J.-M. Mazin. Presentation of a review of the Monte San Giorgio reptile. Examination of specimens in Milano, Besano, Induno-Ollone and Bergamo.	June 1991

Nevada August 1991
Fieldwork, northwestern Nevada, prospecting Lower and Middle Triassic outcrops for vertebrate fossils (with Dr. Martin Sander from the Palaontologisches Institut der Universität Bonn).

London, England September 1991
Member, Visiting Group, Department of Paleontology, The Natural History Museum, London.

San Diego, California October 1991
51st Annual Meeting of the Society of Vertebrate Paleontology, San Diego, CA. Presentation of a paper on the homology of the amniote astragalus.

William D. Turnbull

Australia March - April 1991
Fieldwork in Victoria and New South Wales, Australia. Study Museum collections

Wyoming July - August 1991
Fieldwork, Washakie Formation

Zoology

Rüdiger Bieler

Massachusetts, February 1991
Museum of Comparative Zoology, Harvard University, collection-based research

Florida, February-Mar 1991
Smithsonian Marine Station and Harbor Branch Oceanographic Institution, research and collecting

Florida, April-May 1991
Smithsonian Marine Station and Harbor Branch Oceanographic Institution, research and collecting

California, University of California, Berkeley - AMU meetings, invited paper; field collecting and study of museum collections	June-July, 1991
Azores & mainland Portugal, Symposium, collecting, study museum collections	July-August 1991
Florida, Smithsonian Marine Station and Harbor Branch Oceanographic Institution, research and collecting	September-Oct 1991
Barry Chernoff	
Venezuela National Academy of Sciences, Caracas, Invited Presentation	January 1991
Venezuela Universidad Central de Venezuela, Caracas, seminar	January 1991
Venezuela Fieldwork	January - Febr 1991
Michigan University of Michigan/Ann Arbor, research	January, April 1991
Philadelphia, PA Academy of Natural Sciences, research	April 1991
Washington, D.C. United States Natural History Museum, research	April 1991
College Station, TX Association of Systematics Collections, paper presented	May 1991
New York American Museum of Natural History, research	June 1991
New York, American Society of Ichthyologists and Herpetologists meetings, 2 papers presented	June 1991

Thomas Gnoske	
Uganda, Ruwenzori Mountains - collecting & studying birds	April - May 1991
Steve Goodman	
Madagascar, Fieldwork - Birds and Mammals	February-May 1991
Tanzania, Fieldwork - Mammals	June-August 1991
Lawrence Heaney	
Sabah, Fieldwork - Malaysian mammals	February 1991
Philippines, Fieldwork - Philippine mammals	February-April 1991
Kansas, Kansas State University, ASM Meeting	June 1991
Washington, DC Conservation International, consultation Research - Smithsonian Institution	August 1991
R. F. Inger	
Brunei and Sabah, Malaysia. The field work in Brunei was conducted to obtain samples of amphibians and reptiles from a new locality on the island of Borneo for purposes of comparison to previous collections.	August 1991
Sabah, Malaysia. The field work in Sabah, Borneo is a continuation of a community study sponsored by the MacArthur Foundation.	October - Nov 1991
Julian Kerbis	
Uganda, Fieldwork - Mammals.	March-May 1991
Zaire, Fieldwork - Mammals	May-June 1991

John Kethley	Nevada ASA/ESA meetings, presented paper	December 1991
	California Research - acari	December 1991
Scott M. Lanyon	Canada, American Ornithologists' Union Meeting	August 1991
Al Newton	Nevada ECN/ESA meetings, presented paper	December 1991
	California Toured four major collections and conducted field research.	December 1991
	Hawaii Conducted Coleoptera Larvae workshop and field research	June 1991
Bruce Patterson	Arizona, Research meeting - nested subsets.	March 1991
	Kansas, Kansas State University, ASM Meeting	June 1991
Mary Anne Rogers	Kansas, Kansas State University, ASM Meeting	June 1991
William Stanley	Kansas, Kansas State University, ASM Meeting	June 1991
Daniel A. Summers	Canada Canadian National History Museum. Society for the Preservation of Natural History Collections	May 1991

Margaret Thayer	
Nevada ECN/ESA meetings, presented paper	December 1991
California Toured four major collections and conducted field research.	December 1991
Hawaii Conducted Coleoptera Larvae workshop and field research	June 1991
Janet Voight	
Texas, University of Texas Marine Biomedical Research Institute, study specimens of octopoda	January 1991
Florida, Rosensteil School of Marine and Atmospheric Science, University of Miami, study specimens of octopoda	February 1991
Washington, D.C., United States National Museum, Smithsonian Institution, study specimens of octopoda and teuthoidea	April 1991
California, University of California, Berkeley - AMU meetings, invited paper; California Academy of Science and Santa Barbara Museum of Natural History, study museum collections	July 1991
Canada, Canadian Museum of Nature, study museum collections	December 1991
H. K. Voris	
Phuket, Thailand The field work in southern Thailand focused on the symbiotic relationship between the edible mud crab and the barnacles that live in the crab's gill chambers.	May - June 1991
Phuket, Thailand Seminar presented at Phuket Marine Biological Research	May 23 1991

Center: "Role of Marine Snakes in the Trophic Structure of the Indian Ocean."

University Park, Pennsylvania August 1991
1991 Joint Annual Meeting of the Society for the Study of Amphibians and Reptiles and the Herpetologists League, 1 paper presented.

Mark Westneat
Atlanta December 1991
American Society of Zoologists meetings, 2 papers presented

David E. Willard
Florida, January 1991
Archbold Biological Station, collaborative research on Peruvian birds

Uganda, April - May 1991
Ruwenzori Mountains - collecting & studying birds

Canada, August, 1991
American Ornithologists' Union Meeting

FIELD MUSEUM LIBRARY

Field Museum Library maintains and builds collections of books, journals and other special materials that are essential to the Museum's research, exhibition, and educational programs. The Library serves a number of different publics, each with distinct needs, and strives to balance the requirements of all users in order to provide the best possible service. In addition to the services provided to Museum staff, volunteers, interns, visiting scientists, specialists and consultants, Library collections are available to the international community of natural science researchers through the Interlibrary Loan Program. Library resources are also offered to the public at large through the Library's Public Reading Room.

The escalation in the cost of scientific journals that began in the early 1980's continues unabated. Research libraries nationwide are reporting that they are making substantial cuts in funding for serials acquisition. At Field Museum Library, selective cancellations of costly journals each year since 1984 have finally controlled the growth of serials expenditures. Additional titles have been targeted for cancellation to keep costs within funding levels without further depleting book purchase funds, which have been devoured by serials costs.

The Friends of Field Museum Library made many contributions to Special Collections during 1991, adding significant zoological and botanical works to the Rare Book Collections through the Friends Fund, and inspiring a number of gifts to the collections from individuals. The Runnells Rare Book Fund made possible the acquisition of the Singer Mycological Library, and purchase of original ornithological paintings and drawings by Prideaux John Selby and George Miksch Sutton. The Rosenthal Conservation Fund continued its support of the ongoing restoration of Rare Books and Special Collections.

PROFILE OF FIELD MUSEUM LIBRARY HOLDINGS AND COLLECTION ACTIVITY, 1991

SUMMARY TABLE

		VOLUMES ADDED					VOLUMES USED		
		BOOKS ACQUIRED BY:							
LIBRARY	VOLUMES HELD 12-31-90	PURCHASE	EXCHANGE	GIFT	JOURNALS	VOLUMES HELD 12-31-91	MUSEUM STAFF*	PUBLIC VISITORS	INTER-LIBRARY LOANS
GENERAL	101518	167	62	68	473	102288	2022	1113	543
ANTHROPOLOGY	36509	221	49	88	133	37000	847	1165	253
BOTANY	30581	123	29	53	139	30925	431	148	114
GEOLOGY	35417	52	21	19	181	35690	380	353	98
ZOOLOGY:									
BIRDS	11315	82	12	11	21	11441	188	129	99
MAMMALS	3874	47	7	8	15	3951	236	139	111
INSECTS	14074	22	12	15	68	14191	156	77	146
INVERTS	3811	24	3	7	12	3857	56	8	52
FISHES	975	9	2	2	8	996	32	31	12
AMPH/REPTILES	1536	29	4	13	5	1587	42	44	63
ZOOLOGY TOTAL	35585	213	40	56	129	36023	710	428	483
TOTAL, ALL LIBRARIES	239610	776	201	284	1055	241926	4390	3207	1491

*FIGURES FOR USE OF LIBRARY COLLECTIONS BY MUSEUM STAFF ARE DERIVED FROM CIRCULATION CHARGE FORMS FILLED OUT WHEN STAFF TAKE LIBRARY MATERIALS FROM THE STACKS TO THEIR OFFICES. NO FIGURES ARE AVAILABLE FOR THE AMOUNT OF ONSITE USE IN THE LIBRARIES, INCIDENTAL BROWSING AT THE SHELVES, OR USE OF LIBRARY MATERIALS FOR PHOTOCOPYING.

PROFILE OF FIELD MUSEUM LIBRARY
HOLDINGS AND COLLECTION
ACTIVITY 1991

	VOLUMES HELD 12-31-90	VOLUMES ADDED: BOOKS ACQUIRED BY: PURCHASE	EXCHANGE	GIFT	JOURNALS	VOLUMES HELD 12-31-91	VOLUMES USED: MUSEUM STAFF	PUBLIC VISITORS	INTER-LIBRARY LOANS
GENERAL WORKS. ENCYCLOPEDIAS. INDEXES	1048					1048	3		
MUSEUMS. MUSEOLOGY	1106	7	1	3	8	1125	30	46	46
PERIODICALS (GENERAL)	675					675	7	2	
ACADEMIES & LEARNED SOCIETIES (GENERAL)	2231	1			8	2240	3		
PHILOSOPHY. PSYCHOLOGY. RELIGION	1468	4	2	3	0	1477	26	28	4
AUXILIARY SCIENCES OF HISTORY	465	2		1	1	469	3	5	2
HISTORY; GENERAL & OLD WORLD	7060	11	10	5	14	7100	142	81	13
HISTORY; AMERICAS	4966	11	11	4	8	5000	75	35	5
GEOGRAPHY	5581	13	1	6	22	5623	149	69	17
ANTHROPOLOGY									
PERIODICALS	9427	0	0	0	56	9483	118	133	44
COLLECTIONS. GENERAL WORKS, METHODOLOGY	596	2	2	3	3	606	16	14	1
PHYSICAL ANTHROPOLOGY	655	11	1	1	4	672	18	12	11
ETHNOLOGY. GENERAL WORKS	880	8	2	4	3	897	66	44	6
GEOGRAPHIC DIVISIONS									
AMERICAS	5371	80	21	28	13	5513	200	431	41
EUROPE	61	1				62		4	1
ASIA	877	4	2	4		887	5	13	2
AFRICA	1851	10	4	3	3	1871	65	68	9
OCEANIA, AUSTRALIA, NEW ZEALAND	1522	18	2	2	2	1546	64	111	6
SPECIAL REGIONS & RACES	32			1		33	7		1
ARCHEOLOGY									
PERIODICALS	4204	0	0	1	32	4237	60	43	55
COLLECTIONS; GENERAL WORKS; METHODOLOGY	759	22		2	2	785	35	25	24
GEOGRAPHIC DIVISIONS	2239	19	6	10	2	2276	49	100	11
FOLKLORE	657				1	658	10	20	3
MANNERS & CUSTOMS (GENERAL)	206					206	14	6	1
RECREATION	129	1		1		131	4	1	
SOCIAL SCIENCES	1499	3	1		1	1504	8	4	3
POLITICAL SCIENCE	243					243	2	1	
LAW	95			1		96	3	1	
EDUCATION	183		1			184	1		
MUSIC	272	3		2	1	278	4	7	
FINE ARTS	2617	20	7	23	8	2675	65	88	31
LANGUAGE & LITERATURE	2781	18	0	1	3	2803	33	19	4
SCIENCE									
PERIODICALS (GENERAL; INTERNATIONAL)	2523				22	2545	84	9	3
SOCIETIES (CHIEFLY PERIODICALS)	15736	0	0	1	65	15802	118	92	30
COLLECTIONS; HISTORY OF SCIENCE	1231	2		1	1	1235	25	4	5
MATHEMATICS	102	1		1		104	1	9	1

	VOLUMES HELD 12-31-90	---------VOLUMES ADDED----------				VOLUMES HELD 12-31-91	------VOLUMES USED------		
		BOOKS ACQUIRED BY: PURCHASE	EXCHANGE	GIFT	JOURNALS		MUSEUM STAFF	PUBLIC VISITORS	INTER-LIBRARY LOANS
SCIENCE (CONTINUED)									
ASTRONOMY	337					337			
PHYSICS	554	3	1	1		559	4	7	
CHEMISTRY	275	1				276	4	1	
GEOLOGY									
PERIODICALS (GENERAL & INTERNATIONAL)	1743		1		10	1754	10	1	1
COLLECTED WORKS; GENERAL WORKS	1059	3	1	3	8	1074	3	9	2
PERIODICALS (SOCIETIES, INSTITUTIONS)	6579	0	0	0	64	6643	47	46	22
GEOGRAPHICAL DIVISIONS	12105	2	1	2	41	12151	39	79	2
MINERALOGY	1305	0	2	0	7	1314	45	10	0
PETROLOGY	429	1	1	0	3	434	3	0	4
DYNAMIC & STRUCTURAL GEOLOGY	1709	7	1		4	1721	23		4
STRATIGRAPHY	597	1	3	1	3	605	12	1	5
PALEONTOLOGY									
PERIODICALS	2144	0	0	0	23	2167	55	116	22
COLLECTED WORKS; HISTORY; GENERAL	468	10			1	479	21	14	3
STRATIGRAPHIC DIVISIONS									
PALEOZOIC	64					64		2	
MESOZOIC	60		1	1		62		1	2
CENOZOIC	99	1	1			101	3	1	6
GEOGRAPHICAL DIVISIONS	163	2	1			166	3	2	1
PALEOZOOLOGY									
GENERAL WORKS; POPULAR WORKS	153				1	154		1	1
INVERTEBRATES	475	6	4	3	1	489	14	2	5
VERTEBRATES	619	9	2	1	0	631	52	50	2
PALEOBOTANY	504	4	1	3	4	516	31	1	4
NATURAL HISTORY									
PERIODICALS (GENERAL; INTERNATIONAL)	2194				12	2206	72	40	17
COLLECTIONS; HISTORY; GENERAL WORKS	905	6	2		2	915	21	11	5
PERIODICALS (SOCIETIES, INSTITUTIONS)	12412	0	0	0	65	12477	209	249	88
NATURE CONSERVATION	469	6	3	8	7	493	114	19	15
GEOGRAPHICAL DISTRIBUTION									
PHYSIOGRAPHIC DIVISIONS	1212	2		1	9	1224	50	5	7
TOPOGRAPHICAL DIVISIONS	1258	8	1	3	2	1272	57	57	11
MICROSCOPY	415				1	416	7	2	1
BIOLOGY	4141	40	6	7	41	4235	244	91	32
BOTANY									
PERIODICALS (GENERAL; INTERNATIONAL)	2284				18	2302	37	3	5
COLLECTED WORKS; POPULAR WORKS; HISTORY	1584	5	2	6	2	1599	20	6	4
PERIODICALS (SOCIETIES; INSTITUTIONS)	8048	0	0	0	74	8122	122	18	55
PLANT-LORE; CLASSIFICATION	1360	15	4	6	3	1388	30	28	2

	VOLUMES HELD 12-31-90	---------VOLUMES ADDED---------- | BOOKS ACQUIRED BY: PURCHASE	EXCHANGE	GIFT |	JOURNALS	VOLUMES HELD 12-31-91	------VOLUMES USED------ MUSEUM STAFF	PUBLIC VISITORS	INTER-LIBRARY LOANS
SCIENCE (CONTINUED)									
NATURAL HISTORY									
BOTANY									
GEOGRAPHICAL DISTRIBUTION	5131	34	7	6	9	5187	60	34	4
SPERMATOPHYTA. PHANEROGAMS	3241	18	5	20	0	3284	52	31	4
CRYPTOGAMS	3822	29	3	7	15	3876	35	2	14
PLANT ANATOMY	333	2	1		1	337	14	1	
PLANT PHYSIOLOGY	450	4	1	2	5	462		1	
PLANT ECOLOGY	511	5	1		2	519	8	3	2
ZOOLOGY									
PERIODICALS (GENERAL; INTERNATIONAL)	1794				8	1802	51	7	29
GENERAL WORKS; RESEARCH METHODS; ETC.	1631	6	1		8	1646	39	15	5
PERIODICALS (SOCIETIES, INSTITUTIONS)	6279	0	0	0	61	6340	186	102	104
ZOOS; AQUARIA; SPECIAL TOPICS	199	4	1	9	1	214	6	3	23
GEOGRAPHICAL DISTRIBUTION	1727	5	2	2	6	1742	38	7	13
CLASSIFICATION. SYSTEMATICS. NOMENCLATURE	243	1				244	8		
INVERTEBRATES									
PROTOZOA; PORIFERA; ECHINODERMATA	397	8	1	1	1	408	12	4	3
WORMS; BRACHIOPODA; BRYOZOA	302	1			1	304	4	1	2
MOLLUSCA	2722	12	2	6	8	2750	33	2	44
ARTHROPODA									
CRUSTACEA; MYRIAPODA, ETC.	390	3			2	395	7	1	3
ARACHNIDA	489	2	1	1	2	495	4		12
INSECTS	13585	20	11	14	66	13696	152	77	134
VERTEBRATES									
GENERAL WORKS; GEOGR DISTR; PROCHORDATA	82	3	3			88	3	2	1
FISHES	975	9	2	2	8	996	32	31	12
REPTILES & AMPHIBIANS	1536	29	4	13	5	1587	42	44	63
BIRDS	11315	82	12	11	21	11441	188	129	99
MAMMALS	3874	47	7	8	15	3951	236	139	111
ANIMAL BEHAVIOR & PSYCHOLOGY	1368	9			15	1392	36	22	7
ANATOMY; EMBRYOLOGY	2410	2		1	11	2424	61	9	3
HUMAN ANATOMY	270	1				271	7	1	
PHYSIOLOGY	909	4	1	2	6	922	15	13	4
MICROBIOLOGY	93	1				94	1	6	
MEDICINE	634	1		5	7	647	4	7	25
AGRICULTURE	12608	18	10	10	35	12681	96	73	48
TECHNOLOGY	5020	6	1	4	12	5043	69	37	9
MILITARY SCIENCE	59					59		1	
NAVAL SCIENCE	120					120			2
BIBLIOGRAPHY; LIBRARY SCIENCE	6020	6	11	2	35	6074	26	4	3
TOTALS:	239610	776	201	284	1055	241926	4390	3207	1491

Scientific Support Services

The Biochemical Laboratories

During the last 20 years the biological sciences have experienced revolutionary technological growth, due in great part to major advances in biochemistry, protein chemistry, and molecular genetics. The consequences of these technological breakthroughs have now been felt not only in biology, but throughout society. Many of these techniques have important applications to many disciplines in Natural History--such as systematics--due to their capacity to elucidate genetic characteristics of organisms.

The development of the Biochemistry Laboratory was given major support in 1991 through the gift of $1,050,000 by the Pritzker Foundation. This unrestricted gift to the Museum will be used initially to support the operation and growth of the Laboratory facility. In recognition of the Pritzker Foundation contribution, in 1991 a Pritzker Curator of Biochemical Systematics ill be appointed.

Some typical situations in the study of Natural History where genetic information can be important are: 1) in systematics, to infer genealogical relationships among a group of organisms to determine how species or populations may have descended from a common ancestor; 2) in biogeography, to determine genetic relationships among groups of populations, such as American Indians, in order to make inferences about historical patterns of migration and settlement; 3) in the determination of the evolutionary relationships of humans to other primates; 4) in endangered species propagation programs at zoological parks, where molecular techniques are often used to infer the genetic health of captive populations; and 5) in the genetic characterization of extinct or endangered organisms from the DNA still contained in the dried skins and bones in museum collections.

The Biochemistry Laboratories, a Field Museum research facility, is continuing its development program to establish molecular biological techniques and procedures at the Field Museum as tools for research staff in their studies of long-standing problems in natural history. John G. Hall, Manager of the Biochemical Laboratories, coordinates the development and use of these facilities.

The Biochemistry Laboratories currently operate facilities for the amplification and sequencing of specific genes or gene segments (DNA) from specimens in the FMNH

collections. The capability to target a specific sequence of DNA in the genome, amplify it, and study its properties--is the result of a recent technological innovation, known as the polymerase chain reaction (PCR). PCR technology opens the door to the study of genes from organisms that were previously inaccessible to genetic study.

It enables the characterization of individual genes from DNA extracted from small pieces of tissue, including dried skins, bone, tissues stored in alcohol, single hairs, and even single cells.

In 1991 the Biochemistry Laboratories continued to produce DNA sequence data, obtained with the help of PCR technology. In his studies of blackbirds and other avian groups, Scott Lanyon has accumulated DNA sequence data from an approximately 900 base pair region of the mitochondrial cytochrome b gene for over 65 species of birds, representing 40 genera and 7 families. The total sequence determined to date in this project exceeds 60,000 bases, each being a potentially useful character for the reconstruction of evolutionary relationships. The relationships inferred from these data have provided important insights into the evolution of several behavioral and ecological characteristics of these avifauna. Scott Lanyon is extending this study through amplification and sequencing of other parts of the mitochondrial genome.

Sara Hoot, a post-doctoral research associate with Peter Crane in the Geology Department, has begun a major project to elucidate phylogenetic relationships among the flowering plants in the Ranunculidae, in part by sequencing two genes (rbcL and atpB from the chloroplast genome and an 18S ribosomal RNA gene from the nuclear genome.

In addition, several preliminary projects were completed 1991 or are still in progress: 1) relationships among the higher fungi inferred from sequeneces of nuclear ribosomal RNA genes (Gregory Mueller, Botany Department); 2) phylogenetic relationships among the Carnivora inferred from mitochondrial DNA sequences (John Flynn, Geology Department); 3) evolutionary relationships among Southeast Asian species of the frog genus Rana using mitochondrial cytochrome b gene sequences (Robert Inger and Sharon Emerson, Division of Amphibians and Reptiles); and 4) several sucessful projects in the divisions of Birds and Mammals that explored the feasibility of amplifying and sequencing DNA from preserved museum specimens.

Starch gel electrophoresis of proteins, another biochemical technique, has been used for over 25 years in biochemical systematics research and is useful for generating data regarding genetic relationships among populations of a species or populations of closely

related species. This technology continued to be employed by Field Museum staff in their work in 1991. Larry Heaney, curator of mammals and Townsend Peterson, a postdoctoral research associate in the Division of Mammals, are currently collecting morphological data, enzyme electrophoresis data, and DNA sequence data, as part of a study of the phylogenetic relationships among fruit bats of the genus Ptenochirus on different islands in the Philippines. To accommodate the current and future demand for electrophoresis research facilities, the Laboratories' starch gel electrophoresis equipment had been improved with the construction and purchase of more reliable electrophoresis apparatus.

As these research projects progress, the Biochemistry Laboratories continued 1) to develop protocols to increase the efficiency, reliability, and economy of these technologies, 2) to adapt PCR and DNA sequencing techniques for the genetic analysis of preserved specimens in FMNH collections, and 3) to create more opportunities for the Field Museum scientific staff to use these techniques in their research.

Scientific Support Services

Computing Services

Computing Services is charged with responsibilities for supporting diverse computer activities at Field Museum. During 1991, a large proportion of staff time was allocated to areas other than Research and Collections. Even so, in 1991, Computer Services maintained and improved existing collection management applications for Mammals, Birds, Amphibians and Reptiles, Insects, Geology, Anthropology, and Botany. C/Base is the commercial database software used for all centralized database applications. C/Base provides a menu driven interface to access a variety of screens, reports and editing functions, loan management and label routines.

Computing hardware used to support Research and Collection activities consists of a Digital Equipment Corporation VAX 11/785, running the UNIX 5.3 operating system, more than 120 personal computers and a lowspeed (9600 bps) network connecting the VAX and PCs together; these systems along with a wide range of peripherals such as printers, terminals, plotters, etc., comprise the equipment available to more than 150 researchers and staff.

Installation of hardware and software to support wide area networking has been completed and Field Museum has joined CICNet. Museum staff and researches now can send electronic mail or initiate logins to remote systems as can others communicate with Field Museum.

Also in 1991, we began considering replacing the VAX 11/785 with another system which could consolidate all hardware into a single system, increase network connectivity within the museum, and merge image processing application software with collection databases.

In October, James Koeppl, Computing Services Manager, took a leave of absence to assume the position of coordinator for a project assessing the computing needs of the major natural history museums in the United States. This project, funded by the National Science Foundation, will involve a review of the existing computer hardware and software in use in the museums and also recommending future development and coordination of the computer facilities. While Dr. Koeppl is in residence in the Field Museum, Peter Lowther has assumed responsibility for the management of the Computing Services Department for the 18 month term of the project.

Field Museum Press

Fieldiana Publications - 1991

Anthropology

No. 16. A Late Pre-Hispanic Ceramic Chronology for the Upper Moquegua Valley, Peru. By Charles Stanish; 1991. iii + 68 pages, 308 illus. $17.00 (Publ. 1425).

No. 17. The Isaac Cowie Collection of Plains Cree Material Culture from Central Alberta. By James W. VanStone; 1991. iii + 56 pages, 41 illus. $17.00 (Publ. 1427).

Botany

No. 26. Flora Of Peru. By J. Francis Macbride and collaborators. Family Asteraceae: Part V. By Michael O. Dillon and Abundio Sagastegui Alva; 1991. iv + 70 pages, 21 illus., map. $15.00 (Publ. 1422).

No. 27. Pteridophyta Of Peru. Part IV. 17. Dryopteridaceae. By Rolla M. Tryon and Robert G. Stolze, with the collaboration of John T. Mickel and Robbin C. Moran; 1991. iii + 176 pages, 26 illus., 1 map. $33.00 (Publ. 1424).

No. 28. Flora Costaricensis. William Burger, Editor. Family 97. Krameriaceae--Family 103. Zygophyllaceae. 1991. v + 43 pages, 8 illus. $13.00 (Publ. 1428).

Geology

No. 21. *Protoptychus hatcherii Scott*, 1895. The Mammalian Faunas of the Washakie Formation, Eocene Age, of Southern Wyoming. Part II. The adobetown Member, Middle Division (= Washakie B), Twka/2 (In Part). By William D. Turnbull; 1991. 30 illus., 6 tables. $13.00 (Publ. 1421).

No. 22. A Catalogue of Type Specimens of Fossil Vertebrates in the Field Museum of Natural History. Classes Amphibia, Reptilia, Aves, and Ichnites. By John Clay Bruner; 1991. iii + 51 pages, 1 illus. $15.00 (Publ. 1430).

Zoology

No. 63. Phylogenetic Systematics of the *Amolops* Group of Ranid Frogs of Southeastern Asia and the Greater Sunda Islands. By Da-Tong Yang; 1991. iii + 42 pages, 30 illus., 2 tables. $14.00 (Publ. 1423).

No. 64. Systematic Review of Philippine Macaques (Primates, Cercopithecidae: Macaca *fascicularis* subspp.). By Jack Fooden; 1991. iv + 44 pages; 11 illus., 11 tables. $15.00 (Publ. 1426).

No. 65. The Birds of Cerro de la Neblina, Territorio Federal Amazonas, Venezuela. By David E. Willard, Mercedes S. Foster, George F. Barrowclough, Robert W. Dickerman, Peter F. Cannell, Sadie L. Coats, Joel L. Cracroft, and John P. O'Neill; 1991. iii + 80 pages, 10 illus., 5 tables. $19.00 (Publ. 1429).

Scientific Support Services

Photography

The Photography Department provides a full range of photographic services to the Field Museum staff of Collections and Research, Public Programs, Development and Museum Services. The Department also makes its services and collection available to a diverse group of scholars, educational and research institutions, governmental granting agencies, scientific publishers, and commercial publishers.

The Department is responsible for new photography, processing services, and for maintaining the Photography collection. It currently holds over 500,000 images, and grows annually by an estimated 15,000. The collection at FMNH contains the only comprehensive visual documentation of our scientific collections, field work, and the history of the museum. Photographs in the collection range from the earliest field expeditions to the most current SEM photographic images. These images are produced by photographers in the Department, and by curators, researchers, and others. The processing services provide for film processing, printing, copying and duplicating. Staff photographers produce new photography of artifacts and specimens in the studio, and photograph events, exhibits and activities.

Overall production of photographs increased, with over 1,000 requests, producing over 15,000 black and white prints. Our photographers worked on many assignments for FMNH curators and researchers, including on-going work for Lance Grande, Associate Curator of Fossil Fishes. This project requires a detailed photographic study of both fossil and living species of ray-finned fishes. Other projects in 1991 were photographs of a collection of Blackfoot objects for James Van Stone, Curator of North American Archaeology and Ethnology. These were for his *Fieldiana* publication. Several thousand prints were processed for the Botany Department's Type Photo Collection, and for photographs made by various FMNH curators and researchers

Public Programs photography assignments included the permanent exhibit projects of "Pacific Spirits", "Into the Wild", "Africa", "Life Over Time", "Animal Kingdom", and a variety of hall closings and deinstallations. New photographs of the dioramas in the Nature Walk portion of the "Into the Wild" exhibit were published in the FMNH calendar, distributed to our members, and through our Women's Board. These and other promotional photographs of the Into the Wild exhibit were used in press kits and releases sent to over 1,800 media contacts nationally and internationally.

Other notable projects for FMNH publication included the Biennial Report, and an addition to the Centennial Collection of books, a volume on Gems. Work for the semi-monthly membership publication *In The Field* has been on-going.

We completed the majority of the work related to the NEH-sponsored project in 1991. From late 1989 through this year, Chicago Albumen Works and the project staff duplicated over 23,000 deteriorating cellulose nitrate negatives. The installation of a Humidity, Ventilation and Air Conditioning (HVAC) system was completed in November. This system provides climate control for the entire Collection. In the first few months of 1992, the project staff will complete the computerized data-base inventory of the negatives, and the information will be uploaded to the Museum's mainframe VAX computer.

Over 325 outside sources requested photographs from the Collection. These photos are used in textbooks, for scholarly research, museum exhibit displays and advertising. Income produced from the sales of photographs and permissions was $18,579. Inquiries and research requests from non-profit sources increased from 450 in 1990 to 478 in 1991. Gratis prints and permissions to universities, institutions and individuals rose from $5,700 to $5,900. Photographs are exchanged for research materials and/or complimentary copies of publications such as exhibit catalogues and journals.

Selected list of photographs from the Collection published or displayed in 1991:
Planet Drum, Mickey Hart and Jay Stevens, Harper San Francisco

Science, Cover Photo, August

Gardner's Art Through the Ages, Harcourt, Brace Jovanovich

Flora Photographica, William Ewing, MacMillan Publishers

Dinosaurs! Television Broadcast, BBC-London

Tradition and Innovation: A Basket History of the Indians of the Yosemite-Mono Lake Area, Bates and Lee, Yosemite Association (publishers)

PHOTOGRAPHY DEPARTMENT
1991 STATISTICS OF PRODUCTION

	Number Jobs	B&W Prints	Color Prints	B&W Film		Color Film		Color Slides
				Rolls	Sheets	Rolls	Sheets	
COLLECTIONS/RESEARCH:								
Anthropology	90	833	0	66	147	23	6	28
Conservation	37	217	1	23	6	14	1	75
Botany	58	1774	0	6	159	3	0	49
Geology	165	1123	219	91	447	105	100	846
Zoology	125	1367	142	32	167	57	0	623
Photography	376	625	52	94	9408	36	196	728
VP C&R	4	117	2	0	0	0	0	8
TOTAL	**855**	**6056**	**416**	**312**	**10334**	**238**	**303**	**2357**
PUBLIC PROGRAMS:								
Program Development	158	572	410	55	61	68	8	395
Design & Production	70	945	82	80	69	79	36	142
Education	45	284	18	53	0	29	24	124
Visitor Services	3	51	2	1	1	1	0	0
VP Public Programs	2	2	0	0	0	1	0	0
TOTAL	**278**	**1854**	**512**	**189**	**131**	**178**	**68**	**661**
DEVELOPMENT:								
President's Office	5	24	36	3	0	10	0	143
Membership	10	87	0	14	9	0	14	0
Public Relations	85	7304	252	20	86	27	46	2730
Women's Board	43	174	495	12	77	29	155	0
Publications	77	436	15	12	124	28	69	6
Development	27	77	8	12	0	4	23	49
Tours	1	0	142	0	0	2	0	0
TOTAL	**248**	**8102**	**948**	**73**	**296**	**100**	**307**	**2928**
MUSEUM SERVICES:								
Museum Store	5	13	0	2	28	6	21	0
Personnel	2	51	0	2	0	0	0	0
FPO	6	26	100	3	3	1	0	0
Housekeeping	4	40	0	3	0	0	0	0
Security Services	2	2	11	1	0	1	0	0
Special Events	7	3	49	0	0	0	3	38
Archives	3	41	2	0	0	0	4	0
Picnic In The Field	2	13	0	0	0	0	6	36
VP Museum Services	1	30	0	0	80	0	80	76
TOTAL	**32**	**219**	**162**	**9**	**3**	**2**	**13**	**74**
QUANTITY PRODUCED BY AREA:								
C&R TOTAL	855	6056	416	312	10334	238	303	2357
PUBLIC PROGRAMS TOTAL	278	1854	512	189	131	178	68	661
DEVELOPMENT TOTAL	248	8102	948	73	296	100	307	2928
MUSEUM SERVICES TOTAL	32	219	162	9	3	2	13	74
GRAND TOTAL	**1413**	**16231**	**2038**	**583**	**10764**	**518**	**691**	**6020**
% OF USE BY AREA:								
C&R	61%	37%	20%	54%	96%	46%	44%	39%
PUBLIC PROGRAMS	20%	11%	25%	32%	1%	34%	10%	11%
DEVELOPMENT	18%	50%	47%	13%	3%	19%	44%	49%
MUSEUM SERVICES	2%	1%	8%	2%	0%	0%	2%	1%

Scientific Support Services

Scanning Electron Microscope

The Scanning Electron Microscope (SEM) facility is a multi-user research area composed of a SEM and its ancillary equipment in Collections and Research.

The SEM has been an invaluable resource for both original research observations and documentation of results for the departments of Anthropology, Botany, Geology and Zoology for nearly two decades. Scanning electron microscopy is particularly valuable for examining fine surface details of three-dimensional objects at magnifications ranging from 5x to 50,000x. In 1989, Field Museum purchased a state-of-the-art AMRAY Scanning Electron Microscope with the support of the National Science Foundation and the Elizabeth F. Cheney Foundation to replace the out-of-date SEM that had serviced the facility for almost twenty years.

Some current research projects that utilize the SEM include: studies of the structure and biology of fossil plants, investigations of the structure of jaws and teeth of small mammals, and evaluations of a various conservation treatments on removing copper sulfite from copper alloy. Other SEM research projects are the examinations of the morphology of staphyliniform beetles, mushroom spores, octopus suckers and arm tips, fruits of various plants, snake scales, liverwort leaves, and a variety of both living and fossil fish. Thirty-five curators, professional staff, students, research associates, and visiting scientists in Collections and Research have employed the SEM in their research in 1991. Researchers obtained over 1300 publishable SEM photographs. SEM photographs were also taken for the new "Sizes" exhibit.

Betty Strack, a part-time staff member, manages the SEM facility. Her duties include supervising the use of the SEM, maintaining detailed records of its use, and providing assistance to staff in their SEM research projects. Betty also keeps the facility in good operating condition which includes performing routine maintenance on instruments.

Scientific Support Services

Scholarship Committee

The Field Museum supports the use of its collections and facilities by outside scholars and students. The Scholarship Committee is responsible for the review of applications and the disbursement of funds for visiting scientists, graduate fellows and undergraduate interns who wish to work with the Museum's collections or collaborate with its scientists. The Scholarship Committee administers seven separate funds. These include the Borg-Warner Visiting Scientist Fund, the Rowley Fund, the Schmidt Fund, the Thomas J. Dee Fellowship Fund, the Armour Fund, the Louer Fund, and the Undergraduate Internship Fund.

During the 1990-91 period, the Scholarship Committee, chaired by Lance Grande, made awards to about 30 individuals in each of the four scientific departments. Of these awards, approximately 1/3 were given to exceptional graduate or undergraduate students who have demonstrated a strong commitment to the study of natural history. The remaining awards were given to scientists from around the world, including scholars from Australia, Eduador, Hawaii, Jamaica, Peru and Venezuela, as well as numerous scientists from the United States and Canada.

SCHOLARSHIPS AND INTERNSHIPS AWARDED 1991

Borg-Warner Robert O. Bass Visiting Scientists
(for the support of visiting scientists)

Antonio Machado-Allison
Hans-Peter Schultze

William A. and Stella M. Rowley Scholars
(for the education of worthwhile students in a field
related to the purposes of the Museum)

Mavis Blacker
Patricia Poleski

Karl P. Schmidt Scholars
(for the training of young scientists
who desire to study at the Museum)

Theodore M. Cole III
Ana Franco Molano
Loyal Mehrhoff
Martin Sander

Thomas J. Dee Fellows

(for research and academic fellowships with priority given to younger, less well established research workers and to graduate students)

Gloria Arana
Maria Cole
Edmundo de la Vega
Shawn Larson
Matthew J. Ravosa
Gorden Bell, Jr.
Michael Debraga
Stephen Donovan
Edith Gomez-Sosa de Rabini
J. D. Stewart
Rachel Benton
Stephen Donovan
Carl Ferraris, Jr.
Fred Wells
Maria Del Carmen Ulloa
Jennifer White

Lester Armour Family Graduate Fellows

(ensures the permanent support of at least one outstanding graduate student)

Tom Schulenberg

Rose M. Louer Fellow

(benefits the education of Illinois students or work by students in Illinois natural history of anthropology)

Partha Banerjee

Internships

(work experience whereby an undergraduate or recent graduate gains hands-on training in his/her field of expertise for one or more semesters)

Matt Bonnan
Jean Porterfield
Bruno Pernet
Donna Lynn Jacob
Yvonne Silva
Robyn Habegger
Nayuta Yamashita

Prince Scholars

(visiting scholar fund to attract high quality scientists and scholars)

William E. Browne

Scientific Support Services

Scientific Illustration

The four museum scientific illustrators are Zorica Dabich, Zbigniew Jastrzebski, Clara Richardson Simpson, and Marlene Werner. Dr. John Engel supervises their activities. All of the illustrators are professional artists with a broad background in drawing and painting and many years of experience in both art and natural history illustration. They are charged with production of illustrations of various subjects, fulfilling the need for visual description of research material. The diversity of research interests of the curatorial staff is reflected in the wide variety of specimens and artifacts illustrated. Virtually all illustrations are produced from actual objects of scientific study, and include descriptive visual presentations, complicated reconstructions of artifacts, skeletal structures and fossil plants and animals. The illustrations are used as an explanatory supplement to the research conducted by the curatorial staff, and appear in various publications, including *Fieldiana*.

Each of the scientific illustrators is able to employ a broad range of techniques and media, and works with a diversity of subjects. However, each illustrator has refined a particular technique. For example, water color paintings of South American monkeys and drawings of botanical subjects utilizing crow quill are the specialties of Zorica Dabich. Clara Richardson Simpson excels in line and stipple representations of zoological and paleontological specimens. Marlene Werner excels in utilizing carbon dust and scratch board techniques of fossil and extant subjects. Zbigniew Jastrzebski has special expertise with pencil or pen and ink stipple rendering of skeletal structures as well as reconstructions of vessels for the anthropology staff.

In 1991 the Museum developed a major new system of computer graphics. The MacIntosh system will assist the Curators and Scientific Illustration staff in preparing high quality illustration, maps, tables, charts, etc. for educational and publication purposes. All illustrators currently are undergoing training in the use of MacIntosh computers as applied to scientific illustration.

COLLECTIONS AND RESEARCH

VOLUNTEERS

Anthropology
Dee Aiani
Dodie Baumgarten
Garland Brown
Sol Century
Peter Coey
Jim Coplan
Connie Crane
Jeanette Delaney
Molly Donovan
Paul DuBrow
Jack Ewing
Malina Gallo
Madeleine Garceau
Peter Gayford
Jim Gaylord
Ann Gerber
Margaret Goes
Leah Goldberg
Laura Good
Robert Gowland
Tom Grygiel
Mark Hayward
Steven Issac
Belen Jaquez
Lisa Labinger
Debra Lazar
Jane Levin
Betty Lewis
Valerie Lewis
Kathy Lutarewych
Jack Macdonald
Andrew MacLeod
Pam Marasco
Sam Mayo
Theresa McGill
Carolyn Moore
George Morse
Louise Neuert
Paula Phillips
Dorothea Phipps-Cruz
Tony Rieck
Christina Scott
Llois Stein
Christine Steinger
Margo Thayer
Ika Tomaschewsky
Julius Wagman
Theresa Williams
Wang-Fai Wong
Ed Yastrow

Botany
Marvin Bassan
Helen Beiser
Sharon Fung
Dennis Hall
Nancy Harlan
Sharon Kramer
Lillie Mannings
Margaret Martling
Selwyn Mather
Sam Mayo
Albert Miller
Naomi Pruchnik
Jessica Rath
Martha Singer
Dan Snydacker
Haydee Trainer
Randy Upton

Geology
Barbara Ballard
Irene Broede
David Ciske
Elizabeth Cook

Gregory Dorr
Aldona Dziedzic
Jane Edmunds
Michael Henderson
Jennifer Lambert
Manuel Matanguihan
John McConnell
Donald Newton
China Oughton
Angie Shaw
Julie Teetsov

Zoology
Neal Abarbanell
Tom Anton
Paul Baker
John Beery
Michael Blanford
Colleen Braker
Lorin Brown
Robert Brunner
Sophie Ann Brunner
Paul Bryan
Beth Burke
Sidney Camras
Robert Cary
Lisa Clarizio
Andy Conklin
Clayton Dean
Sheila Demkovich
Stanley Dvorak
Betsy Ebert
M. Alison Ebert
Andrew Ferris
Joseph Fisher
Ron Garner
John C. Goeb
Thomas Gnoske
Henry Greenwald
Gregory Guliuzza
Mary Hennen
Marcia Horwich
Rachid Idriss
Dorothy Karall
William Kephart
Susan Knoll
Kathy Kozol-Telfer
Scott Kuipers
Lawrence Levin
Melissa Mayer
Larry Misialek
Susan Moy
Lorain Olsen
Thomas Pavela
Carolyn Perusisch
David Rasch
Jim Rataczak
Tony Rattin
Jodi Sedlock
Heather Seeman
Yvonne Silva
Thomas Simon
Jack Sloan
Dave Smiskol
Gary Stafford
Janet Madenberg Stevens
Evelyn Stryz
Julie Stumpf
Nathaniel Trienens
Virginia Turner-Erfort
Marcia Vehlo
Yolanda Velazquez
Michele Waite
David Walker
Maxine Walter
Katherine Wiegmann
Jennifer Wheeler
Laura Zaidenberg

Library
John Craib-Cox
Elizabeth Dilworth
Arden Frederick
Robert Gowland

Ruth Howard
Mabel Johnson
China Oughton
Christopher Quinn
James Reed
Marie Rosenthal
James Skorcz
Worthington Smith

Photography
Reeva Wolfson
Michele Witt

Field Museum of Natural History

Collection Size - 1991

Collection	Number of Specimens
Anthropology	
Central American Archaeology	11,732
Central American Ethnology	2,690
South American Archaeology	16,891
South American Ethnology	8,085
North American Archaeology	135,087
North American Ethnology	99,554
Osteological Collection	4,750
Polynesian Ethnology/Archaeology	5,298
Micronesian Ethnology/Archeology	11,273
Asian Archaeology	1,196
Asian Ethnology	52,496
Near Eastern Archaeology	25,203
Near Eastern Ethnology	666
Old World Prehistory	161,263
Classical Archaeology	11,804
African and Madagascar Ethnology	16,536
Australian Ethnology	2,130
Melanesian Ethnology	36,202
Subtotal	602,856
Botany	
Algae	78,171
Fungi	87,076
Lichens	52,169
Bryophytes	167,279
Ferns	97,547
Seed Plants	2,051,722
Subtotal	2,533,964

Collection

Geology	
Physical Geology	62,898
Invertebrate and Plant Paleontology	398,027
Vertebrate Paleontology	133,702
Subtotal	594,627

Zoology	
Amphibians and Reptiles	249,090
Birds	394,000
Fishes	1,730,971
Insects	9,732,811
Invertebrates	3,828,000
Mammals	141,986
Subtotal	16,076,858
TOTAL SPECIMENS	19,808,305

Field Museum of Natural History
COLLECTION GROWTH

	Anthro	Botany	Geology	Zoology	Total
1981	595,684	2,230,634	509,701	12,011,366	15,346,951
1991	602,856	2,533,964	594,627	16,076,858	19,808,305

USE OF COLLECTIONS BY LOAN
1991

Department	Number of Loans	Specimens Loaned	Specimens Borrowed
Anthropology	17	203	0
Botany	198	17,662	8,063
Geology	61	682	307
Zoology	403	42,401	7,182
Total	679	60,948	15,552

Net Loaned
(Total loaned-borrowed) = 46,075

SCHOLARLY USE OF COLLECTIONS BY VISITORS
1991

Department	Number of Professionals	Number of Students	Number of Others
Anthropology	201	54	84
Botany	120	20	8
Geology	31	70	9
Zoology	192	143	126
	544	287	227